

AUTOMOTIVE INDUSTRIES

AUTOMOBILE

Volume 67

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Number 18

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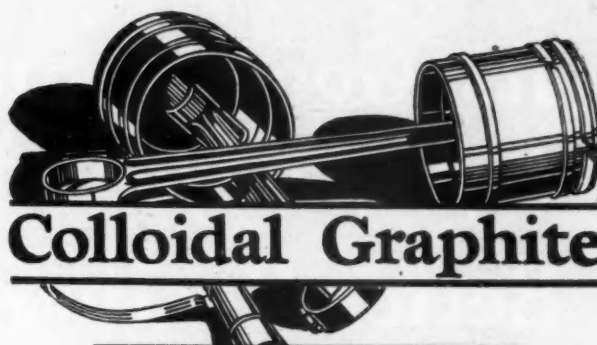
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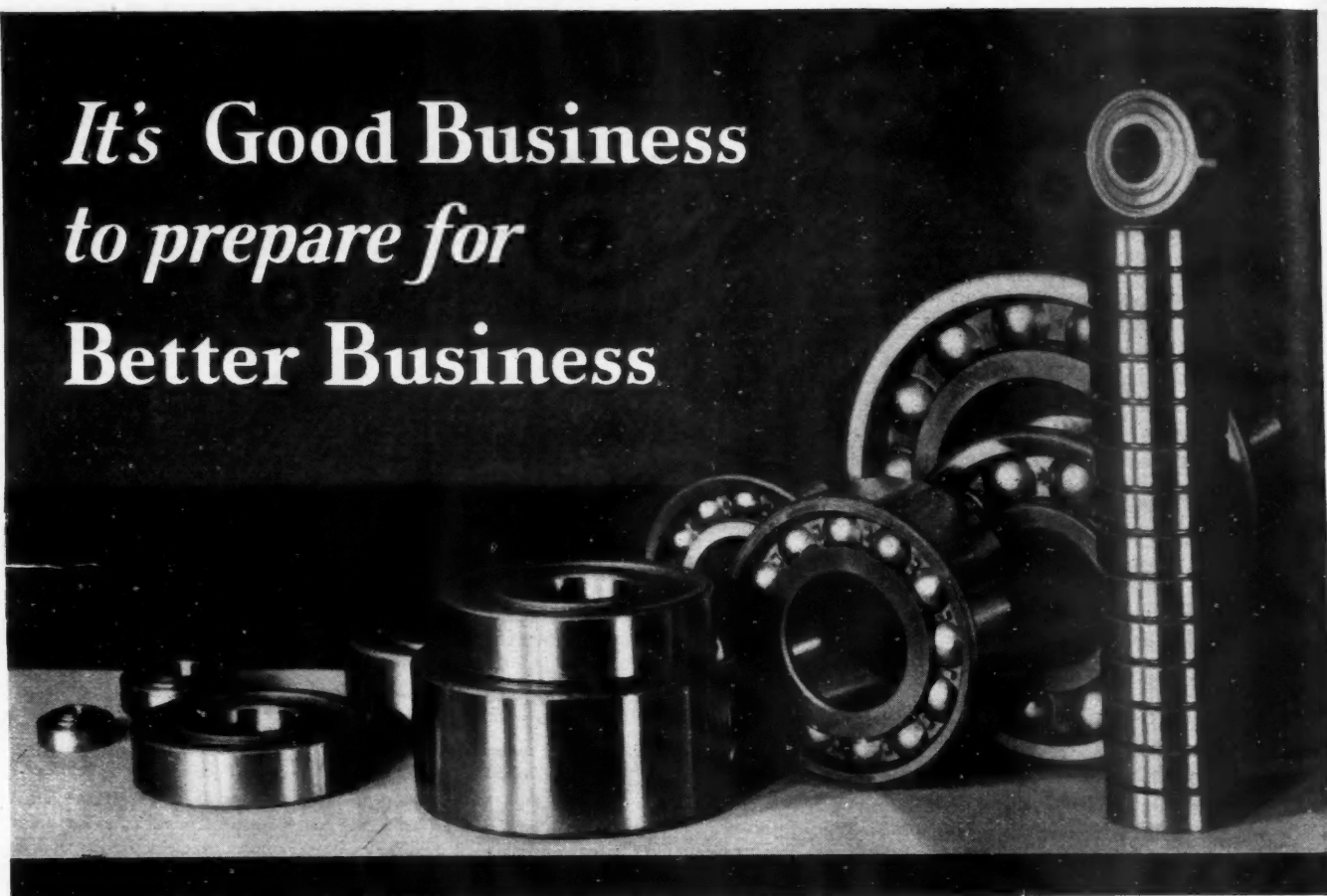
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Automotive Industries

AUTOMOTIVE INDUSTRIES

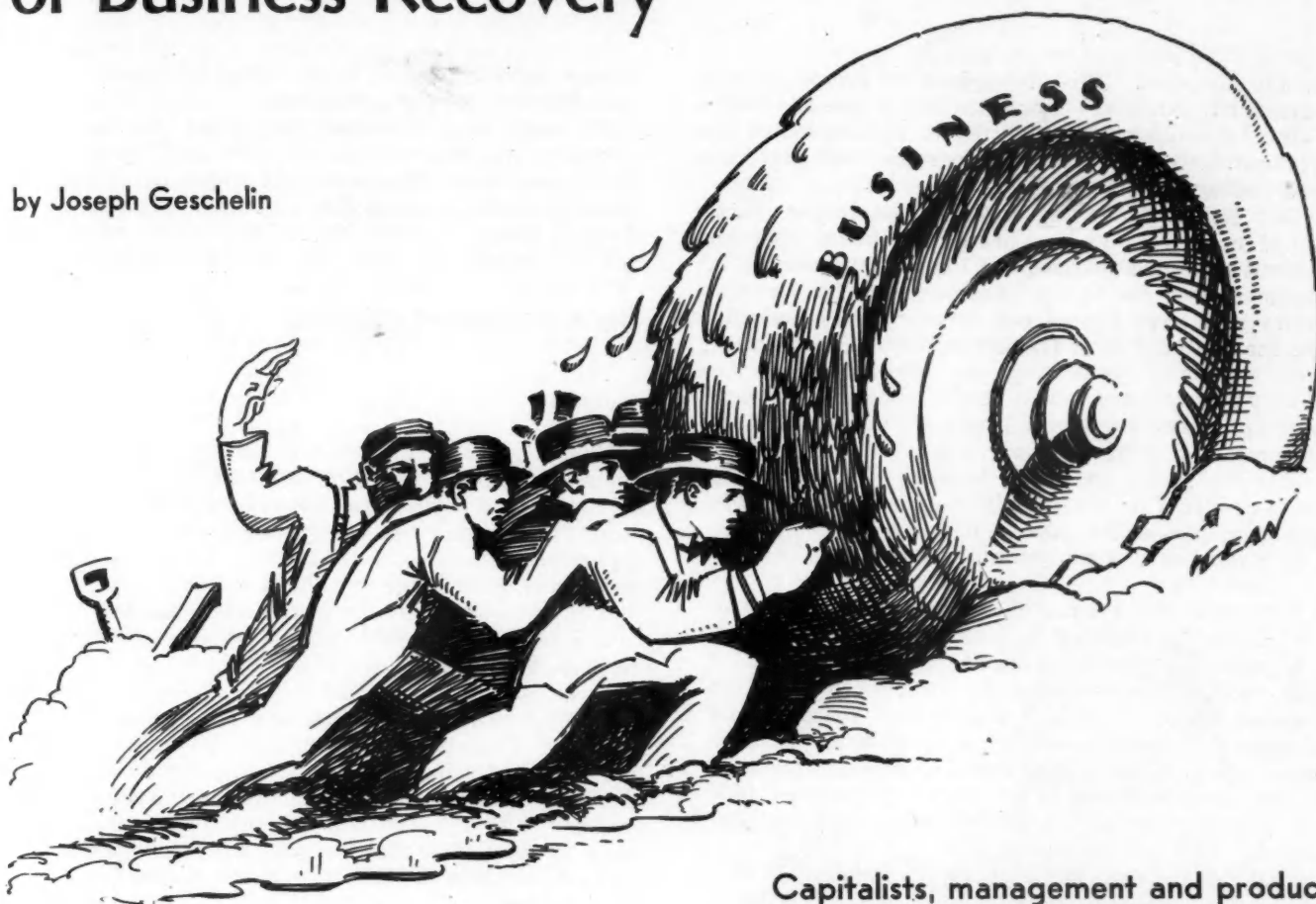
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• THIRTY-FOURTH YEAR •

October 29, 1932

Rehabilitation Cited As Important Factor of Business Recovery

by Joseph Geschelin



Capitalists, management and production engineers are called upon to put shoulder to task of modernizing, re-vamping and improving manufacturing processes as a way to lifting industry from morass

REHABILITATION is for those who intend to stay in business
—for those who expect to maintain leadership in a seethingly competitive market
—for those who want a profit even at the present level of wholesale prices.

This was the gist of the message broadcast by the Committee on Industrial Rehabilitation as interpreted by its chairman, A. W. Robertson, chairman of the board, Westinghouse Electric & Mfg. Co., for a lunch-

eon group of the Philadelphia Chamber of Commerce.

The Committee on Industrial Rehabilitation was pictured by Mr. Robertson as a militant group of business men, awake to the need for direct and immediate ACTION as the means of starting American business

Walter Chrysler on Rehabilitation . . .

"In answer to your letter as to our policy of keeping plant equipment up to modern and high efficiency standards even in periods of relatively low production, I can only say that if one looks to the future, it is, economically, the only thing to do.

"This is not only for low production costs,

but when things are slow in the factory it is the time to make rearrangements and improvements methodically and at the minimum cost — and high quality productive workmanship is the result, thus giving employment to a certain amount of labor at times when it is absolutely important."

on the up-grade. This group does not believe in government in business—now or at any time—and therefore is unwilling to sit idly by in the hope that the government or someone else somehow will start the ball rolling.

Mr. Robertson in his forceful, convincing, hard-boiled manner minced no words in stating that his committee is non-political, not Pollyannaish, not to be confused with the "cures" and panaceas for business cycles that have poured out of everywhere recently. On the contrary it is frankly a "buying" movement, with everybody, particularly the seller, buying. Not a wild buying wave, but a sound, constructive movement to modernize so as to produce a legitimate profit at present levels of wholesale prices.

Malcolm Muir, president, McGraw-Hill Publishing Co., a coworker on the committee, summed up its scope and objectives as follows: to stimulate:

1. Buying of new equipment—where money is available,
2. Process improvements—where complete modernization is restricted by lack of funds,
3. Improved merchandising facilities.

According to students of the economic picture, the financial panic is over. Banks are sounder and stronger. Business shows signs of picking up. The committee is bending its efforts to get this message to American business, to get something started that will intensify and assure the movement for business revival. ACTION is needed now.

What can the automotive industry do about it? Reproduced on this page is a letter published in *Automotive Industries*, Oct. 15, 1932. It tells the world what Walter P. Chrysler is doing about it.

We are just back from a trip through the Middle West. It's stimulating to find how closely some of the

hidden activity comes to Mr. Muir's summation of the objectives of the committee.

We went through several important car factories, considered the last word in efficiency just two or three years ago. Everything has been ripped out. They're starting anew. New machines, new materials-handling devices, improved processes. Some of the new stuff will startle even the seasoned production executive.

The Automotive Battle Field

This is an example of objective 1—buying of new equipment—where money is available, or is made available.

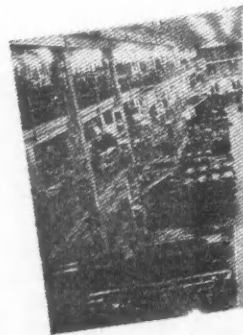
Elsewhere we found plenty examples of objective 2—improved processes. Stated plainly, the automotive field today is a battle royal, with many factories struggling for supremacy in a curtailed market, with price a greater factor than ever before. To stay with the pack, no manufacturer can afford to lag in modernization of some kind. If his immediate competitor puts in new equipment capable of further cutting costs, he must do the same if he is to survive.

Those organizations that can't spare the capital needed for rehabilitation can and have made a compromise. They have attacked process improvements. For the time being they are content with old equipment bolstered by new attachments, new tooling, new fixtures. It's not the sort of thing that they are eager to show off to their friends, but it will tide them over—it may help them to meet the imminent struggle for a market.

When considering process improvements there is an inevitable need for some new equipment. New ma-

" rehabilitation means new equipment buying if necessary, but process improvements at all events not Pollyanna-buy-now not a panacea just plain common sense "

October 29, 1932



Automotive Industries

chines here and there; certainly new fixtures and attachments; nearly always a good deal of materials-handling devices. These needs must be met by a capital outlay. But it can be the minimum compatible with urgent demands.

As Mr. Robertson so aptly puts it, "Business has its elements of risk. No one without courage and initiative can get very far. Now is the time to strike out boldly. Prices are low, labor plentiful, changes will not interfere with present productive activity. Liquid funds drawing low interest would bring infinitely better returns in productive equipment."

The third objective hardly needs any comment except for the fact that it has been relegated to the background of late. Improvement in merchandising facilities is a vital step in the forward march of business. It's up to the seller to create an atmosphere of optimism for the buying public. They need a tonic, a change of scene. Give it to them in bright, new showrooms, factory lobbies, motor trucks, packages, body styles and color.

At least one outstanding motor car manufacturer has taken the long forward step. He has commissioned a successful industrial artist to create showrooms in the new manner for his products. A new scene, a new spirit may help to coax cash out of pockets.

"Our ailment is unemployment—unemployment of men; unemployment of money," says Mr. Robertson. Obviously the unemployed are off the buyer's market. According to Mr. Muir, payrolls are off \$3,000,000,000. Wage cuts are just as insidious because they not only curtail purchasing but create a fear which keeps people from spending even when they have money in savings banks.

An Important Concept

So we come to an important concept. If recent economic changes have taught us anything, they have shown that no individual manufacturer, individual industry, or even a nation, is independent of others. The time is past when we could emulate the ostrich in our business relations.

The point is that our industrial prosperity depends upon widespread employment, adequate income in wages and salaries, and the economic stability of key industries. Perhaps the most important of these is capital goods, which forms the very bedrock of our economic structure. It is estimated by students of the problem that the employment of one man in the capital

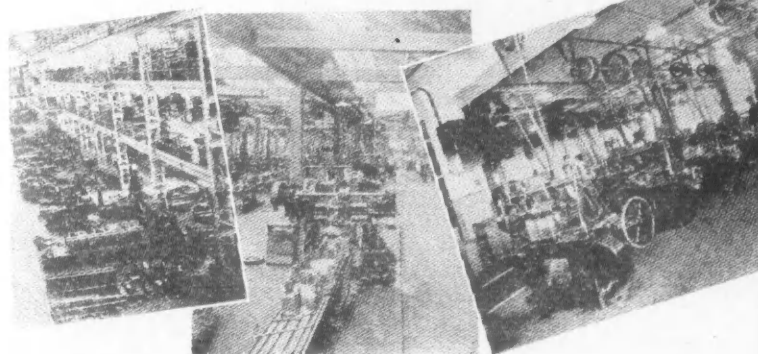
goods industry means employment of three men in consumer goods industries. Conversely, if you lay off one man because of depression in capital goods demand, it may ultimately cause the lay-off of three men in other activities, thus intensifying the recession in consumer goods consumption.

Therefore, without considering anything but sound business, pure self-interest dictates a rehabilitation program at this time. Industry can afford to modernize now because:

1. Many corporations have liquid funds drawing low interest that would be better invested in more profitable equipment.
2. Recent rapid improvement in equipment design offers unusual opportunity for cost reduction.
3. Equipment can be purchased and installed today at a cost way below normal.
4. Changes in equipment can be made now most easily when plants are not busy.
5. Better production efficiencies will improve the company's price position and increase its earning power.
6. Obsolescence means not waste alone but loss of opportunity for better profits.

And, finally, the stimulus of buying capital goods will be reflected in a restoration of much needed prosperity to the capital goods industry—machine tool builders, equipment makers of all kinds, whose prosperity is so bound up with the general recovery of American business.

The Committee on Industrial Rehabilitation has rolled up its sleeves and jumped into the breach. It sees a way to restore the flow of capital, increase employment, carry business out of its doldrums. Self-interest demands that we pitch in and help. By helping we secure our position in the industry—place our own enterprise on a profit basis even with wholesale prices at present levels.



A. W. Robertson, Westinghouse Electric & Mfg. Co., chairman, and head of the Committee on Industrial Rehabilitation

Twelve Makes at the French Salon

Rigid frames are general with several manufacturers using a welded box-section and an extensive use of elongated X-members

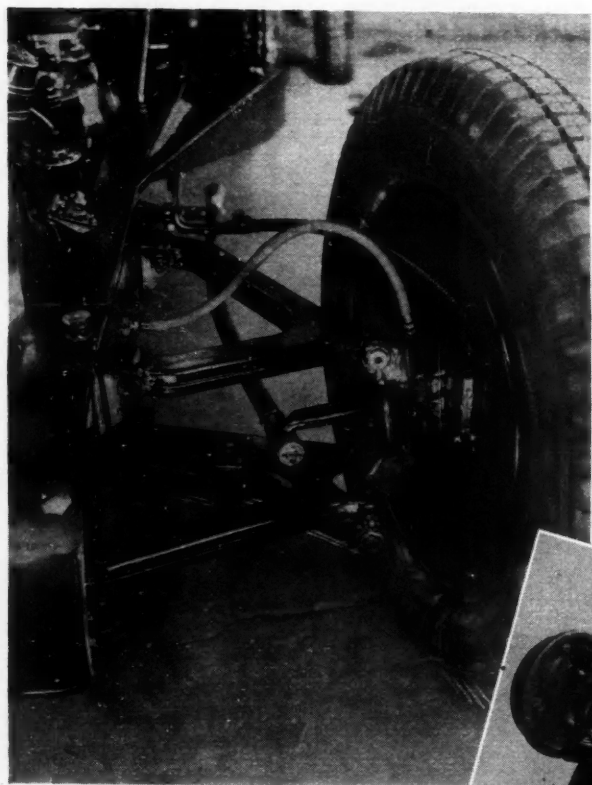
WITH a substantially reduced total, the twenty-sixth French Automobile Salon comprises 39 French makes of passenger cars, 5 German, 5 Italian, 3 British, 2 Belgian, and the following 16 American makes: Auburn, Chrysler, De Soto, Dodge, Duesenberg, Ford, Graham, Hudson, Hupmobile, Lincoln, Nash, Packard, Plymouth, Rockne, Studebaker, and Willys.

The show reveals a further advance in independent wheel suspension by reason of its adoption by Delage, Talbot, Mathis, Andre Dubonnet, Adler, and its continuance by Peugeot, Lancia, Mercedes, D.K.W., Cottin-Desgouttes, Derby and Bucciali. Har-

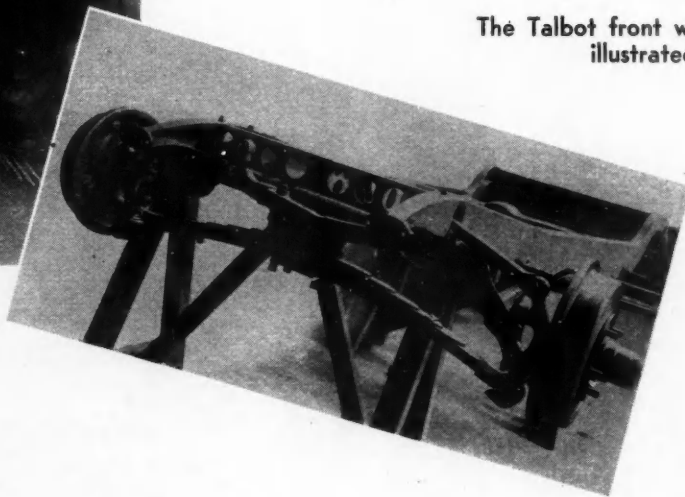
ris Leon Laisne is not exhibiting. Among the above Delage and Talbot have independently sprung front wheels for their biggest production lines, this in each case being a six-cylinder, 122-cu.-in. job. Mathis has applied independent wheel suspension to one model, but contemplates extending it to all types in the near future. The entire production of Peugeot and Lancia has independently sprung front wheels. The small six-cylinder car constituting Mercedes' main production line is on independent springing all round. Adler is building a cheap model with independent suspension to the designs of Engineer Rohr, this make (Rohr) having gone out of existence. The other firms have very small productions. This year independent wheel suspension has definitely stepped out of the experimental into the commercial stage.

Delage, after experimenting for three years on various types of suspension and front and rear drives, has decided on normal rear drive, with independent suspension in front, use being made of a transverse spring, with attachment of the steering pivots by means of two triangles with silentbloc bushings. The triangles are formed of two semi-oval steel pressings, electrically welded. The use of a transverse tie rod is avoided by using two fore and aft drag links, or one to each main steering arm.

This chassis is equipped with a six-cylinder, overhead-valve engine, of 122 cu. in., having a four-bearing crankshaft. The valve springs are not on the valve stem, but under a short rocker arm, with unequal arms, one forked end of which is engaged under a collar on the valve stem. This design has



Above is shown the Delage independent front wheel suspension



The Talbot front wheel suspension is illustrated below

Have Independent Suspension

by W. F. Bradley

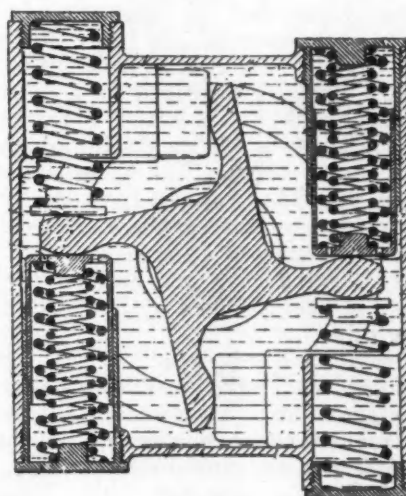
been employed on sports models for a year and is now extended to the entire Delage output.

Talbot makes use of a transverse spring of great flexibility, this spring being clipped to an I-beam forging, forming a cross-frame member. The spring has two rolled eyes, one of them being bushed and attached to the lower end of the steering knuckle. The upper end of the steering knuckle is attached by a welded tubular link, with self-lubricating bushings, to upturned arms on the I-beam. There is further anchorage by channel section radius rods to a point on the chassis under the rear engine hanger. This design gives a single assembly of spring, shock absorbers, steering gear, wheels and brakes, ready for mounting in the chassis.

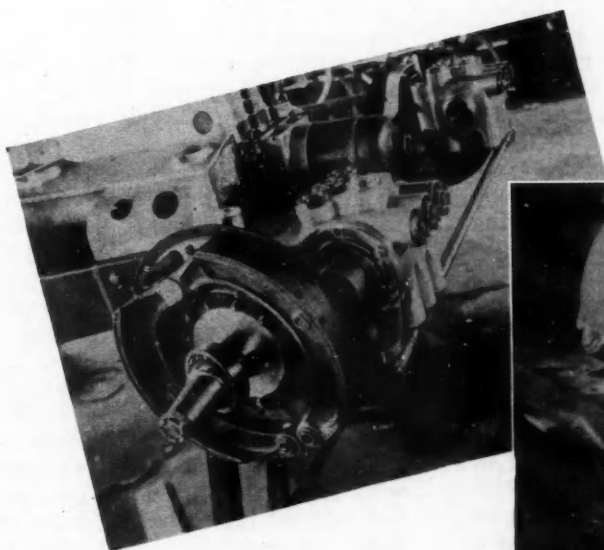
Andre Dubonnet, wealthy automobilist and race driver, has produced an original design of independent wheel suspension in conjunction with Engineer Chedru. Use is made of a series of short coil springs, completely enclosed, and operating inside hydraulic pistons. For each wheel there are 12 sets of triplicate coil springs, nine of these being for suspension and three for recoil. The springs are in contact with short arms on a ball-bearing shaft, the end of this shaft carrying an arm which receives the stub axle. The entire suspension is contained within a compact housing mounted directly on the chassis frame. The pistons operate within cylinders screwed into the housing, and have adjustable holes for the escape of the oil. The feature at the forward end is that the entire suspension is mounted on the steer-

ing pivot and turns with it. In other respects it is similar to the rear springing.

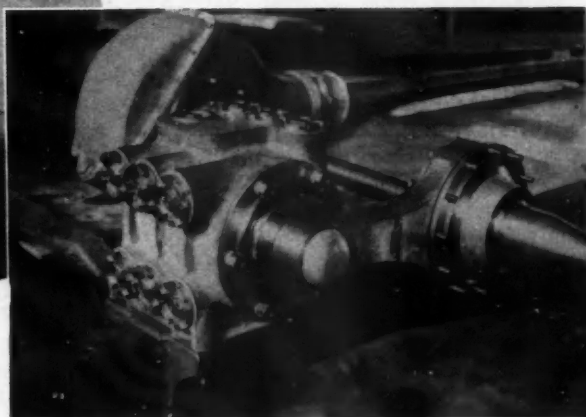
In developing this suspension, Dubonnet realized that an absolutely rigid chassis was essential, and produced an electrically welded box-section frame, with a big central X-member, the whole being of 2.5 mm. (0.100 in.) steel plate. The front cross-member has a thickness of 4 mm. (0.160 in.). The



Sectional drawing of Dubonnet suspension



Front end suspension of the Dubonnet



The drive and rear end suspension of the Dubonnet is in the view below

entire frame is welded, no rivets being used. As the frame has considerable height, the gas tank is set within it, for the full width, behind the rear arms of the X-member, and ahead of the differential housing. The propeller shaft is above the frame member.

For convenience, use is made of a six-cylinder Hispano-Suiza engine, transmission and brake gear. It is claimed that the Dubonnet chassis is 4 lb. lighter than the corresponding Hispano-Suiza chassis, this economy being obtained in the axles, the springs, shock absorbers and attachments. With a sedan body, four passengers, 135 lb. of baggage, 45 gal. of gasoline, oil and water, the Dubonnet sedan weighs 4900 lb.

Rigid frames are general, particularly on cars having independently sprung wheels. Delage has a welded box-section throughout, including cross-members. Talbot has a box-section for all the forward portion. Mathis uses a box-section not only for the chassis frame but for the main body members. Peugeot employs what is described as a bloctube construction, which is an inverted U-section frame, with the mouth of the U closed by an electrically welded flat plate. Citroen has a somewhat similar construction, with the U placed horizontally, and the flat plate vertical on the outside. There is an extensive use of elongated X-members, with the forward arms merging into and welded to the side rails. This has been adopted by Renault and Hotchkiss, among others.

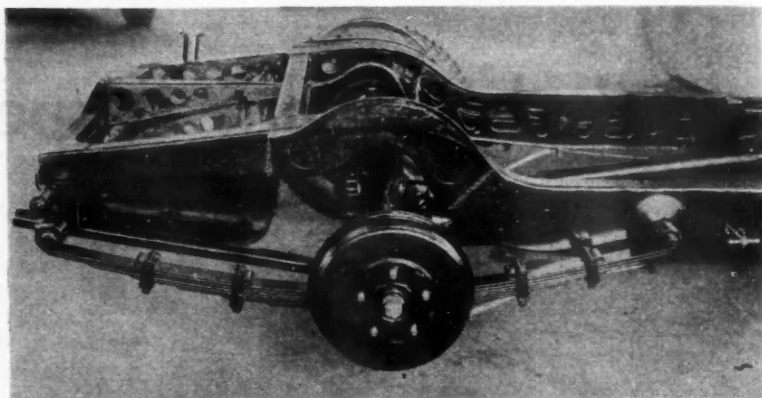
Free wheels have advanced to the commercial stage. Mathis, who introduced this device a year ago, has extended it to all models. Citroen makes the free wheel standard equipment on the bigger types and optional on two smaller models. Lancia has adopted it on a new light car. Renault has taken up the Bendix clutch control and free wheel for all but two models, on which it is offered as optional equipment. Chenard & Walcker are using the Toute free wheel and also the Bendix clutch control. The same plan has been adopted by Panhard.

Synchro-Mesh Gears Have General Adoption

Synchro-mesh gears, with one silent indirect gear, are found on practically all European cars. With a new four-speed transmission, Hotchkiss has three silent gears. Panhard has four silent gears, the patents for which have just been taken up by Chenard & Walcker. There are no epicyclic or self-change gears in the show.

New small cars, usually with four-cylinder engines up to 91 cu. in., are plentiful, and sales competition in this class promises to be keen during the coming year. Practically all makers have dropped down a size, Delage and Talbot now producing 122-cu.-in. sixes, and Hotchkiss marketing a new four of the same piston displacement. The four biggest makers, Renault, Citroen, Peugeot and Mathis, rely on "fours" for their biggest output. Peugeot is exclusively on fours.

The new 6-hp. Ford, with a four-cylinder engine of 57 cu. in., came as a surprise. It is offered in France at \$712. Competing against it is the Fiat "Balilla," produced in Italy six months ago, but now manufactured in France, in order to avoid excessive import duties. The Fiat, which is practically the



The Delage box frame attracted attention

same size as the Ford, sells at \$675. Peugeot has a four-cylinder model with independently sprung front wheels at practically the same price. Citroen's new model, a four cylinder of 2.68 by 3.94 in. bore and stroke, sells at \$780, with four-passenger Berline body. Renault is competing against this with a four-cylinder, 2.76 by 3.74 in. (89 cu. in.), wheelbase 104 in., selling at \$775, and is also offering a straight eight at \$1,100, this being the cheapest eight on the French market. Mathis has a free-wheel four at \$916.

Lancia Engine Mounted on Leaf Springs

Lancia has just produced a light car of outstanding merit selling in Italy at \$980. With the tariff war in existence between France and Italy, it is impossible to import this car, but arrangements are being concluded to manufacture it in Paris, and if the price is maintained, it will become a serious competitor.

With a four-cylinder narrow V-type engine of 73 cu. in., developing 35 hp. at 4000 r.p.m., the car has the same general technical features as the bigger eight-cylinder Lancias. The engine is elastically mounted on leaf springs with a damping device. Valves are inclined in the head, with an overhead camshaft and chain drive. Full pressure lubrication is used, with an automatically cleaning filter. The four-speed transmission, with a silent third, forms a unit with the engine. The free wheel, with a locking device, is immediately behind the transmission. The chassis has an X-type member and forms a unit with the body, the various elements being stamped and welded into a whole. The luggage container, with a hinged door on which the spare wheel is mounted, is an integral part of the body. The front seats are steel pressings, with detachable upholstery. Floor boards are replaced by sheet steel permanently welded in position. This gives a clean underpan, unbroken except for the bottom of the engine base chamber and the exhaust pipe. There are no central door posts, the two doors opening respectively front and rear. Lockheed hydraulic brakes are used. Wheelbase is 104 in. and weight of the sedan model 1800 lb. The front wheels are sprung independently with the system used by Lancia for several years, but without the hydraulic damper. Rear suspension is by semi-elliptics. Roller-bearing spring shackles are used.

JUST AMONG OURSELVES

And in the Meantime

IT'S no news to anybody in the automobile business that new models frequently get into the hands of foreign dealers just about the time the next year's new designs are nearing announcement in the home market. And in these days of rapid communication, this condition causes no inconsiderable amount of merchandising difficulty here and there.

The time lag between complete coverage of export markets and domestic announcement in the United States was impressed on us again today when we received the Sept. 15 issue of *The Radiator*, organ of the New Zealand Motor Trade Association, in which appears an article telling about the first showing of the Ford V-8s and B-4s. "A private showing of these cars," says this magazine, "was made in Wellington by the Colonial Motor Co., Ltd., at the end of August, and similar showings are being made in Timaru and Auckland. . . . The new baby car (that is, the 8 hp. Ford built in England) has not yet arrived in New Zealand, but is expected shortly. The marketing of the baby model has been made possible by an agreement recently made between the Ford Co., Ltd., of England and the Ford Motor Co. of Canada, Ltd. Under this agreement the English company will supply the New Zealand market with baby cars, but other models

will continue to be supplied from Canada by the Canadian company."

The Ford V-8s and the B-4s were announced in the United States about April 2. And the New Zealand showing was just about coincident with the beginning of strong rumors in this country about revisions and improvements in the eight, possibilities of lower prices on the fours and the possible interjection of a six-cylinder model priced in between the two.

The same sort of lag frequently occurs in connection with practically all makes of cars; the Ford example is mentioned here merely because this particular article happened to bring the subject to mind at the moment.

Who Looks Under the Hood

IT is much easier for the average layman to believe that an automobile really is different from all other automobiles *if it looks different*. Unusualness in a body design predisposes Mr. Public to a belief that the whole mechanism is different or better.

When advertising shouts "Here is something new under the automobile sun!" Mr. Public becomes interested in taking a casual look. That casual look for nine out of every ten people takes in only the body at first. And if the body doesn't differ much from all other bodies, nine out of ten people don't go any fur-

ther—for a long while at least. Under the hood and the chassis the automobile may differ radically from its predecessors, but when the body is commonplace the percentage of those enticed to look under the hood is cut down appreciably.

It's the Body That's Seen

A RADICAL body on a commonplace car will attract twice as much attention as a radical car with a commonplace body.

The body makes the car easy for the average person to "spot" after he has read the advertising or heard about the new job from a friend. The tremendous pulling power of a pleasingly "different" body has been proved over and over again. Go back over the last 10 years and name for yourself the car or cars which in each year have had a more than average success. In most cases a new body style has been involved.

If public conversation and emotions were not to be considered, the ideal thing for the manufacturer would be to get out a body which had already been thoroughly approved and keep on building it with minor changes forever. With that ideal in mind, the tendency on the part of most manufacturers is to change as little as possible and still do something which might stir up new interest. No car has ever risen rapidly to success by that method.

Advance notices indicate that next year will see some really definite departures again from the commonplace in bodies. If they materialize, they will be stimulating.—N.G.S.

Variety of Grades Opens New Fields for

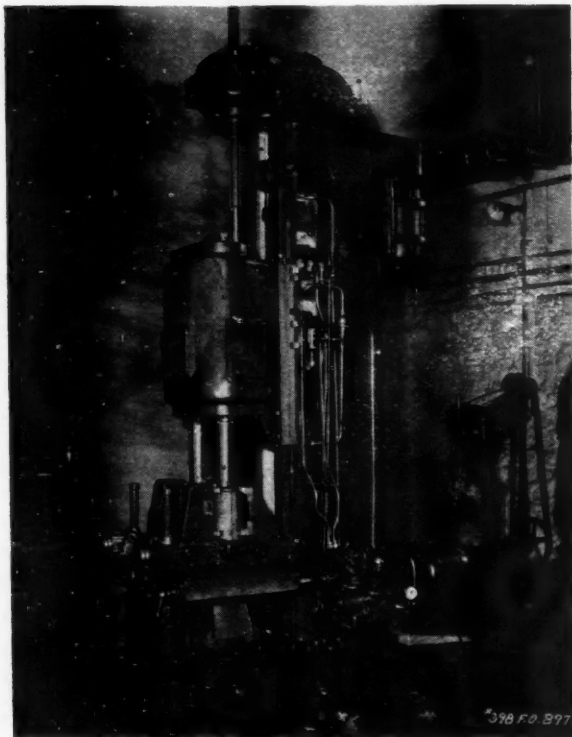


Fig. 2—Here is shown the largest milling cutters in existence

THE advantages of the cemented carbides as to increased cutting speed, long life between grinds, and machining of materials previously unmachinable with other cutting materials, are so well known, and the use of cemented carbide has become so well established in the large production shops, that no further mention of these advantages will be made here. The history and method of manufacture are also quite familiar, so that this paper will cover principally only the latest developments and applications.

In recent months the technique of the manufacture of certain of the cemented carbides has progressed to a considerable extent, and a number of different grades especially suitable for different applications have been produced. At first there was merely "tungsten carbide," and it was necessary to apply one general grade to the whole range of applications from rough hogging on steel down to light finishing cuts on non-ferrous materials, sometimes without the best of success. Today the art has progressed to a point where, by proper selection of a grade suitable for the job to be done, some remarkable savings in manufacturing costs are being obtained.

This can best be illustrated by giving a few examples of application of the different Widia grades. Much of the material has been made available

* Read at the Production Meeting of S.A.E. at Buffalo.

Time, economy, the saving of extra finish cuts and more work between grinds continue to be the outstanding advantages of this cutting material

by Roger D. Prosser*

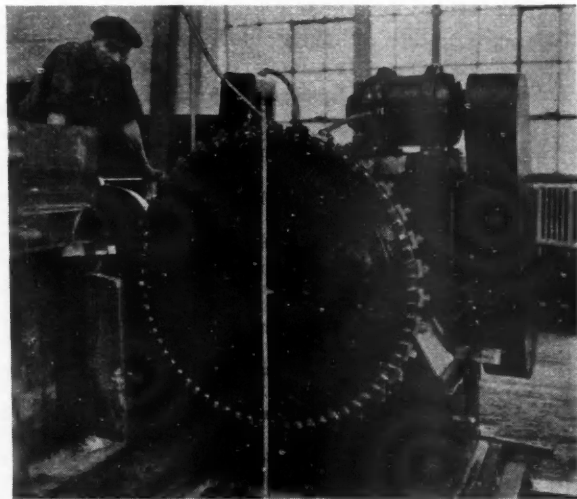


Fig. 2—Here is shown the largest milling cutters in existence

through the valuable cooperation of the machine tool builders, and will indicate what the users themselves are doing with the cemented carbides at this time.

First, the improved standard grade, which is called Widia "Normal," is supplied for the majority of general work on gray cast iron, brass and other non-ferrous materials, also on work of intermittent character, where the best possible combination of toughness and hardness is desired.

Fig. 1 shows a rigid Barnes two-spindle machine boring cast-iron cylinder sleeves with cemented carbide tools. These are bored out from the rough at a cutting speed of 225 surface ft. per min., feed of 0.035 in. per revolution, with a production of 60 pieces per hour. Owing to the extreme rigidity of

for Cemented Carbide

the machine, no finish boring operation is required, and the holes are held to 0.0005 in. tolerance on out-of-round and taper. . Rough and finish turning of these same sleeves' cutting speeds are 225 ft. per min. for roughing, 275 ft. per min. for finishing; feeds 0.035 in. for roughing, 0.020 in. for finishing; production 60 and 70 pieces per hr. respectively. Limits are held to 0.0005 in., and an excellent finish is produced.

Fig. 2 shows a rather unusual application to one of the largest milling cutters in existence. This is fitted with 42 inserted Widia tipped cutters. Cutting speed is approximately $2\frac{1}{2}$ times what it was with the previous tools, the actual machining time is cut in half, and over $6\frac{1}{2}$ hours are saved in grinding and "down" time for each of the large castings machined.

The second grade was developed for the machining of especially hard substances—in particular, chilled cast iron. This grade is called Widia "H-201." One of the best applications for tungsten carbide is the machining of chilled cast-iron rolls, from 75 to 90 Scleroscope hardness, where great savings can be accomplished by the use of this grade. In one plant the machining time was cut from 30 hr. to 6 hr. per roll.

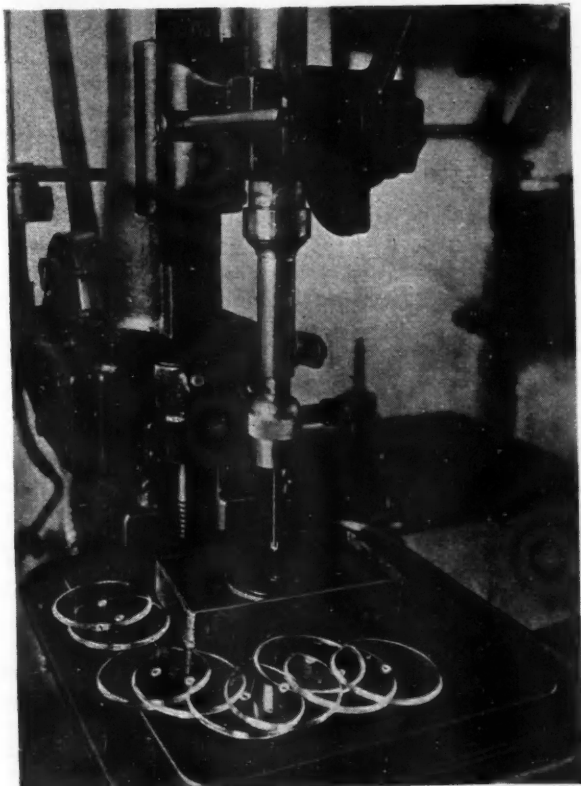


Fig. 4—Intricate tooling requires long life between grinds

"H-201" is also excellent for machining glass and other very hard materials. Manufacturers of switch plates and other glass parts, where holes have to be drilled in glass, are using especially designed drills for this purpose with great success. Fig. 3 shows this operation.

There are many other applications for this grade, which is so useful for the machining of very hard materials. Consider motorcycle cylinders. These castings are quite thin, are semi-chilled, and quite hard, making it desirable to use a special grade of tungsten carbide suitable for this work. Another application is the machining of centrifugally cast brake drums on a Sundstrand machine. The job is boring 12-in.-diameter holes, $1\frac{1}{2}$ in. deep, at 240 ft. per min. Six tools are used in the boring head, and each tool removes 0.010 in. chip per tooth. Thus, in turning one revolution, the boring head advances 0.060 in., which gives a very quick machining time, approximately $1\frac{1}{4}$ min. from floor to floor.

We now come to a special grade which was developed especially to meet the needs of the automobile manufacturers. This grade is called "L-31," and it is rapidly coming into more and more extensive use. It is designed for work where long tool life between grinds, fine finish on the work, close tolerances and great resistance to abrasion are desired, and has proved unexcelled for this class of work. It is very hard and should be used on light work where the chip pressures are not very great, and for this purpose it will hold an edge longer and produce a better finish than either of the previously mentioned grades. Fig. 4 shows intricate tooling, where it is obviously essential to have long life between grinds, on account of the very considerable set-up and grinding time.

Fig. 3—Cemented carbide is used in the machining of glass

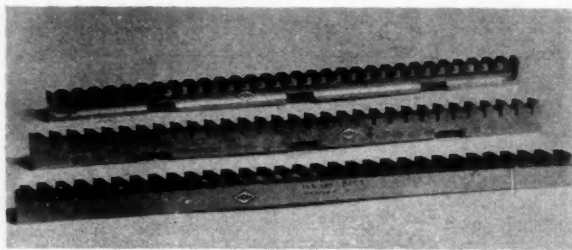


Fig. 5—Broaches made of cemented carbide are held to very close limits

"L-31" is also being used with great success on intricate tools which require a large amount of grinding, such as reamers, broaches, end mills, forming tools, etc. Fig. 5 illustrates broaches having many tungsten carbide teeth, which are held to extremely close limits. Fig. 6, a complicated multi-diameter cutter which performs seven operations at once.

Another excellent application for this particular grade is on the cylinder reboring machines now being so extensively used, an excellent machine of this type being made by Van Norman. The cutter head of this machine advances $1\frac{3}{4}$ in. per min., and produces such a fine finish that it is not necessary to do any honing whatever. This is the fastest method of reboring cylinders known at the present time.

In order to take advantage of the characteristics of "L-31," especially when used on brass, bronze, aluminum, etc., it should be ground to a fine finish on the cutting edge, using a very fine grinding wheel. In many cases, especially where the parts must have a fine finish, results will be improved by finishing the cutting edge on a diamond lap.

Still another grade, which is especially hard and is designed for high-speed precision boring operations, the so-called "diamond boring," is the Widia "M-68." This grade is too brittle to be used in any place except for the lightest work, where the machine runs absolutely smoothly and without vibration. For such operations, however, it is without equal.

Fig. 7 shows the Heald Borematic, an excellent

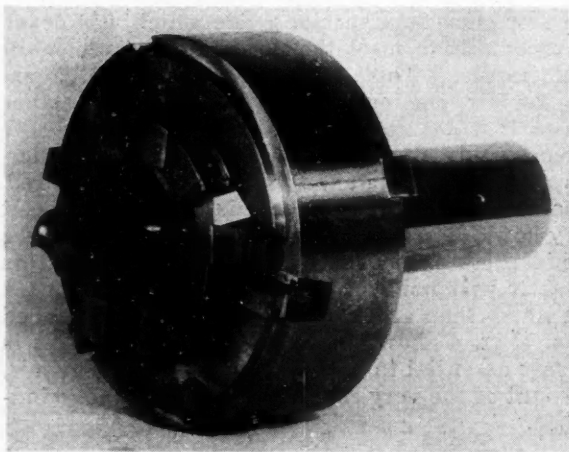


Fig. 6—This complicated multi-diameter cutter performs seven operations at once

high-speed precision machine, set up to machine a variety of refrigerator parts, all at one setting. The cylinder and shaft hole of the crankcase, both ends of the connecting rod, and the piston, are all bored at once. Twenty-one pieces of each are produced per hour, the actual saving in machining cost running from 50 to 75 per cent over previous methods. A beautiful finish is obtained, and the work is held to very close tolerances.

Grade "M-68" is only used for light finishing cuts. It should be ground to an extra fine cutting edge and should always be finished on a diamond lap.

The latest grade is Widia "X," which is designed especially for the machining of steel at cutting speeds of from three to six times those used with high-speed steel. This grade has great resistance to the cratering action on the top surface of the tool ordinarily encountered with hard metal compositions, with consequent increased life between grinds. Fig. 8 shows the increased efficiency of grade "X" over high-speed steels. In machining steels of various characteristics it will be seen that with the efficiency of the high-speed steel given as 100 per cent, the increased efficiency of "X" in these test ranges

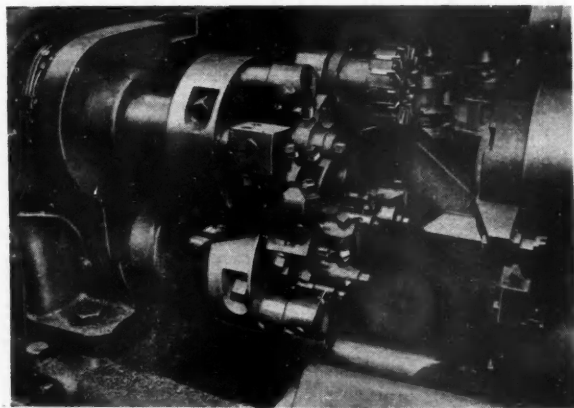


Fig. 7—This Borematic machine is set up to perform a number of operations at one setting

from 300 per cent to 600 per cent. This increased efficiency was obtained by increasing the cutting speeds, while maintaining the same rate of feed and depth of cut.

These figures, of course, apply only to operations on steel which are suitable for the use of cemented carbides. There are still many places where no cemented carbide can be applied with success. However, there are many applications where the tool pressures remain at reasonable figures and the machine equipment is in first-class condition, where grade "X" tools are being used to great advantage, permitting the greatly increased cutting speeds and longer tool life mentioned above. Cemented carbide tools should not be applied to steel jobs indiscriminately; rather, each operation should be carefully studied by an expert cemented carbide man, to determine whether it has possibilities of becoming an economical application.

One example of the application of this new cemented carbide to the machining of steel is illus-

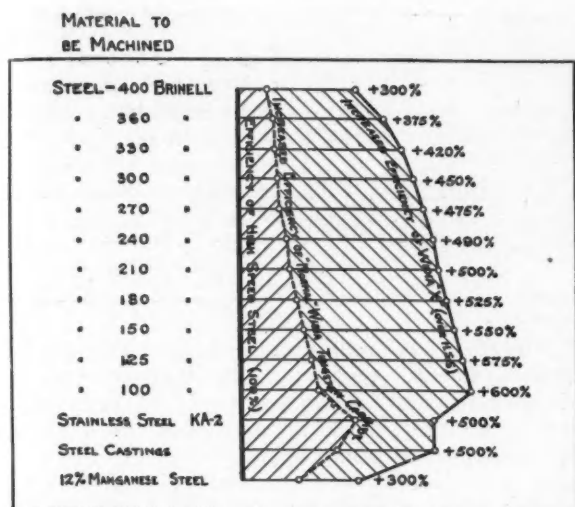


Fig. 8—The accompanying graph shows the advantages of cemented carbide tools over high-speed steels

trated by the facing of both ends of a machine steel bushing for a motion picture projector. This tough

material is machined at 1250 r.p.m., instead of 280 r.p.m. with high-speed steel. One piece is now produced every 16 sec. instead of one every minute with high-speed steel, and about 5000 pieces per grind can be had, instead of 200 with high-speed steel. Sizes are held to tolerances of 0.0004 in. Ordinary cutting oil is used.

Unusual Applications

There are a number of unusual applications for cemented carbides which have been proving very successful. For example, several types of measuring instruments and gages have been faced with Widia. These facings maintain the accuracy of the instrument throughout a long life. Spring forming guides are being used with great success.

Drills are in constantly increasing demand. They are at the present time being used for special purposes, such as the drilling of hard rubber, bakelite, slate, etc., where pressures are not very great. Other applications must be tried with considerable care, due to the fact that the shank size of a drill cannot be increased to give better support, as it can in the case of a lathe tool.

New Valve for B-K Brake Boosters

A SECTIONAL view is shown herewith of what is known as the Type XT $\frac{1}{2}$ external valve for B-K brake boosters.

Opening V is connected to the intake manifold of the engine and through a tee connection to the front end plate of the cylinder. Opening C is connected to the rear end plate of the cylinder.

When the engine is running and the brake pedal is in the off position the operation of the valve is as follows: The air within the cylinder at the rear of the piston is taken through the nipple in the end plate to opening C, passed by valve 1 through opening V and into the manifold of the engine. The air in the cylinder in front of the piston is taken through the nipple in the front end plate to tee connection and into the manifold of the engine.

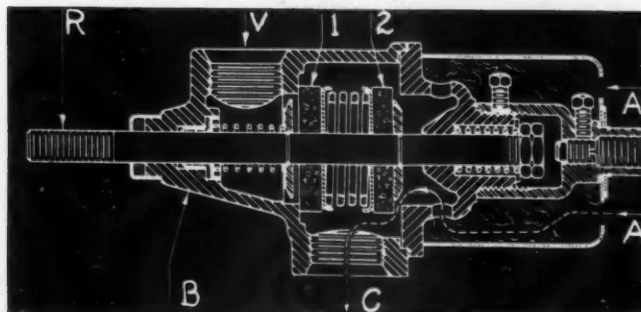
When the brakes are applied valve rod R is moved forward, seating valve 1 and opening valve 2 as shown in the illustration. When valve 1 seats, and valve 2 opens, vacuum is no longer maintained in the cylinder at the rear of the piston but is maintained in the cylinder in front of the piston. Valve 2 opening when valve 1 closes or seats, air at atmospheric pressure is admitted through the air filter A, and passed by valve 2 through opening C to the cylinder at the rear side of the piston.

The amount of air admitted to the rear of the cylinder depends upon how far the brake pedal is depressed. If the operator stops the forward movement of the pedal, the valve casing or body B, which is connected to the brake mechanism, will move forward sufficiently to close the atmospheric valve and stop the admission to the rear of the cylinder of any additional volume of air at atmospheric pressure. This is due to the fact that when the air is admitted to the rear of the cylinder the piston will continue to move forward as long as the atmospheric valve is held open. When the forward movement of the pedal is stopped the cylinder will continue to

pull the brake mechanism sufficiently to move the casing of the valve forward, so that valve 2 seats and then, to accomplish any further forward movement of the piston in the brake cylinder, the pedal must be further depressed.

When the brakes are fully applied and the valve mechanism is in the position shown, any further force exerted by the driver on the brake pedal will be transmitted through the stops (not shown) between valve rod R and body B, through the valve body and through the brake mechanism.

When the operator releases the pressure on the pedal after the brakes have been applied and permits the pedal to move rearwardly, atmospheric valve 2 will close, shutting off the atmospheric pressure at the rear of the piston, and valve 1 will open, establishing communication between the cylinder at the rear of the piston and the intake manifold. The air at the rear of the piston in the cylinder is then admitted to the manifold. Pressures on both front and rear of the piston are equalized, and the brake mechanism is permitted to be released by its retracting springs.



Section through B-K vacuum brake booster valve

Inspection of Surfaces for Minute Defects*

THE importance of adequate final inspection in the manufacture of a quality product has led to the development of an automatic machine which is capable of inspecting the surface of an article with such close scrutiny that in polished or ground surfaces even fine cracks which are just visible to the eye can be detected and the pieces which contain them automatically thrown into the discard. The speed and cost of the inspection are about the same as with visual inspection, but the reliability is greater.

While the machine described below was designed for the inspection of ground cylindrical steel pieces for cracks, ingot breaks, burned spots, and spots not cleaned up, the utility of the principles involved is by no means confined to this field alone. Such a machine may be applied to the surface inspection of any kind of piece for defects which change the light reflectivity or transmissivity.

The general arrangement of the equipment is shown in Fig. 1. The product to be inspected is so mounted and moved that during the process all parts of its surface lie at some time within the field of view of the "electric eye," while a suitable source of light furnishes illumination so that the eye may see and transmit its opinion of the quality of the surface to the memory unit. A vacuum-tube amplifier in the line increases the importance of this opinion, so that if the eye sees a bad spot, the memory is suitably impressed, and, lying in wait for the product at the termination of its inspection, it grasps it in its rejection device and consigns it to the scrap heap.

The essential details of the electric eye are shown in Fig. 2. A beam of light from an intense source passes through a set of condensing lenses and, falling on a smaller lens of high curvature, is further condensed to illuminate very brilliantly a small spot of the surface under inspection.

A microscope objective lens, together with an eye-

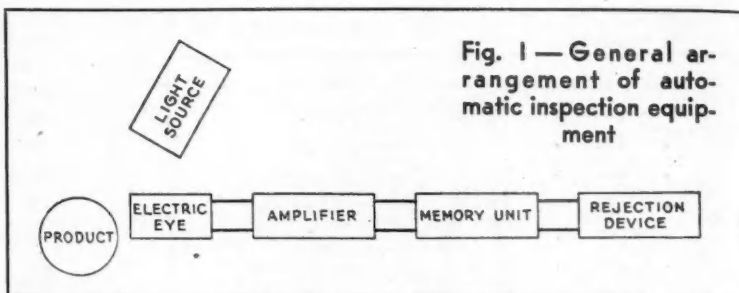


Fig. 1—General arrangement of automatic inspection equipment

piece lens, forms a real image of this illuminated area on an opaque screen having a small aperture whose size determines the field of view of the apparatus. Light passing through the aperture falls on a photoelectric device which produces an electric current proportional to the illumination it receives, and if a portion of the surface having a reflecting power lower than the rest comes into the field of view, the current immediately drops in value.

Inasmuch as a decrease in reflecting power indicates for most products a surface defect, the consequent decrease in current is made, after amplification, to operate the memory unit, and if the deficiency in reflection is more than a predetermined amount rejection follows.

The details of the memory unit are shown in Fig. 3. The unique feature of this part of the equipment consists in the use of a hot-cathode ionization tube containing a grid and a small pressure of some suitable gas. If a voltage exceeding the critical value is applied between the grid and the cathode, the gas in the tube is ionized, resulting in a very great increase in anode current. This current is easily sufficient to operate a simple rejection device such as a shutter or trap-door in a trough, down which the product slides on its way out of the machine.

When the inspection of an article is started, the final tube is in a de-ionized condition, and if the surface of the product is sufficiently uniform it remains so and the work is accepted. If, however, the electric eye sees a bad spot on the surface, it transmits to the amplifier an impulse of voltage which, after amplification, is sufficient to cause ionization in the final tube.

The machine described was developed in the Department of Engineering Research of the University of Michigan.

* From Mechanical Engineering, Sept., 1932.

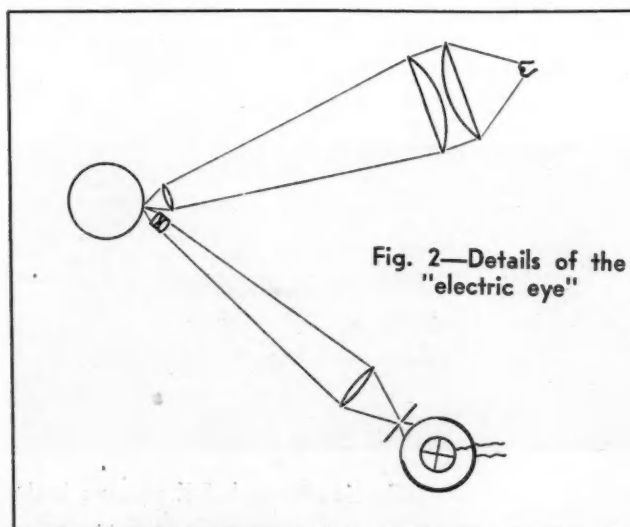


Fig. 2—Details of the "electric eye"

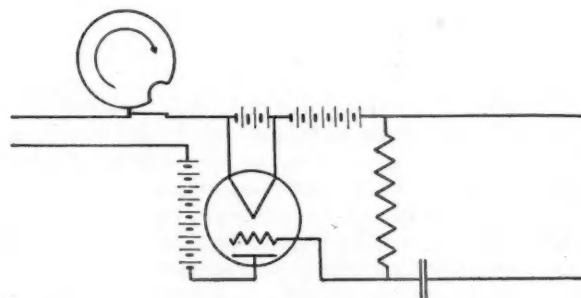


Fig. 3—Details of the "memory unit"



38 Bendix-Cowdrey brake testers just off the production line, ordered by the U. S. Post Office

PRODUCTION LINES

Saves Dies and Steps

U. S. Patent No. 1,854,630, granted this year to one of our correspondents, holds much of interest to die designers and press shops. It describes a window-forming die for auto bodies, and claims to eliminate the redraw operation and dies required therefor. The principal claim is the ability to form window openings with one die in one operation. The inventor will be glad to supply complete details of his die construction. Much possibility that the principle involved may be adapted for other kinds of drawing operations.

Egg Crate Styles

Our Detroit scout contributes this one about the fashion in shipping crates for finely finished parts. For one thing, it seems that corrugated cardboard containers have been found superior to and more economical than wooden boxes. One large maker of main bearing and connecting-rod liners has just developed an egg crate type of shipping case after a lot of research. Liners fit into separate compartments in much the same way as eggs, except that the row of compartments adjacent to the side walls and top and bottom layers are left vacant. This provides the needed flexibility for safety.

Cooperation Counts

Again the machine tool builders have shown the right spirit in a

pinch by helping in the rebuilding of machine tools in the factories. Genuine replacement parts, new tooling, and reconditioning, have brought many machines up to par, at least so far as immediate necessity is concerned. This enables many people to carry on until they can afford the needed investment in modern, high production equipment.

From Pioneers

Much interesting design data on spiral bevel and hypoid gearing has been collected to make up a booklet, "Engineering Data on Large Hypoid Gears," published by the Gleason Works, pioneers in the field of gear cutting. It deals largely with standard gear sets for industrial applications. Suggests in some detail the best methods for building mountings. Should be of interest not only to those who buy gears but also to those who cut their own. Engineers, production men and purchasing agents will welcome this handy reference manual.

New Paths

A new approach to the theory and practice of electroplating, especially chrome plating, is engaging the attention of the Electrochemical Section of the Bureau of Standards. According to Dr. William Blum there seems to be little prospect of increasing the efficiency of the present type of bath. Hence the need for an entirely new procedure. Time will tell.

Next to Godliness

Soap and water, liberally used, saved the day in at least two large manufacturing plants recently. Boils were prevalent in one. Everything from cutting oils to scrap was blamed. A little campaign, involving the regular use of hot water and soap did the trick. In another plant, the inspectors were below par. Tired eyes, listless. Soap and water on walls, ceilings, electric globes, brightened things up, brought immediate relief. Little details maybe, but how effective.—Contributed by the Cleanliness Institute.

Here's How

How a new Keller machine fits into the tool room scheme of an automotive plant is shown in a booklet published recently by the Pratt & Whitney Co. Some unusual applications of the Type BL Keller automatic are described and pictured. Also complete specifications of the machine.

New Wrinkles

Synchronizer cones for Ford transmissions are made in an unusual manner. Instead of machining from tubular stock, as is customary, the parts are formed from flat sheets on presses. The production man's ingenuity seemingly knows no bounds.—J.G.



Conveyor, Half Mile Long, and Pneumatic Tubes Speed Handling of Chrysler Parts

COMplete mechanization through the use of modern materials handling equipment is one of the outstanding features of the gigantic Chrysler Motors Parts Corp., a division of the Chrysler Corp.

It supplies parts for approximately two million Plymouth, DeSoto, Dodge and Chrysler cars in use all over the world. Offices and main factory utilize one-half of the Chrysler Highland Park plant, comprising 53 acres and 1,800,000 square feet of floor space.

Parts orders which arrive at the rate of two a minute are handled smoothly and swiftly without delay or confusion. Thousands of feet of pneumatic messenger tubes aid speed and accuracy, routing carbon copies of orders to strategically located "picking stations" for filling. An endless conveyor more than a half mile long connects all "picking stations" with the packing and shipping departments.

It is to J. L. Kenyon, vice-president and general manager of the Chrysler Motors parts division, that most of the credit is given for the centralizing of this efficient unit.

Mr. Kenyon's broad view of the motor car parts business is indicated by his statement that "Although the supply of service parts generally is accepted as a simple, commonplace procedure and viewed by some as an uninteresting but necessary adjunct of the average manufacturing business, it is a positive and major factor in the business of the Chrysler Corporation.

"From a comparatively small beginning that dates back to the early Chrysler days, this function of Chrysler

Parts orders arriving at the rate of two a minute are handled smoothly and without delay or confusion

Motor business has grown and expanded until now the Parts Corporation manufactures, stocks and distributes parts for all Chrysler products."

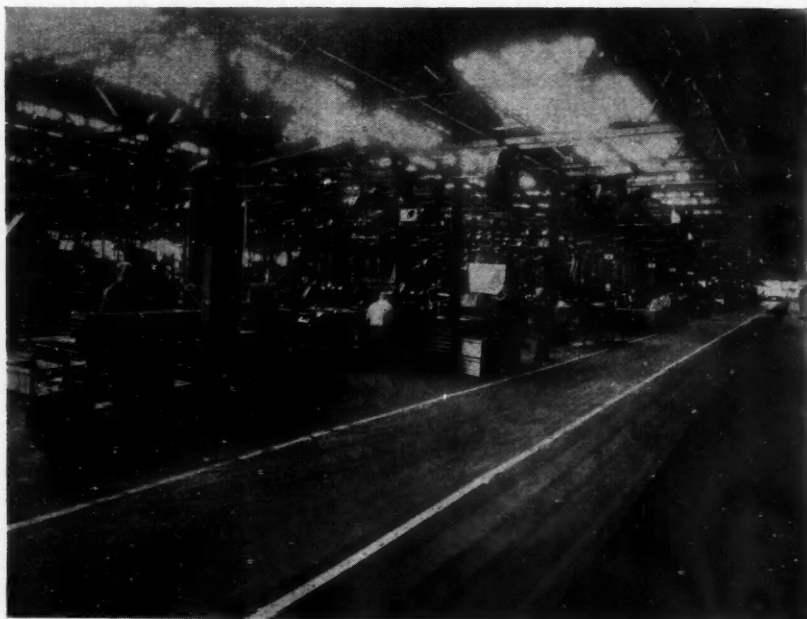
A visit to the plant in Highland Park reveals row after row of closely placed shelves, bins and stacks extending over a space of 1321 feet in length by 410 feet wide and containing a stock of 115,000 different items sufficient to supply the requirements of nearly 10,000 Chrysler Motors dealers.

It is said that in that immense stock there is every part needed for every Chrysler Motors product ever built. Complete chassis of models long out of production can be assembled from the parts on hand.

Analysis of the turnover of parts stock year after year shows that only 5000 of the 115,000 items account for 47 per cent of the dollar sales volume and that 10,200 items provide 85 per cent of the total. Thus, 90 per cent of the parts on hand are comparatively slow moving but must be provided for to insure against any undue delay, no matter how unusual the request may be.

The Chrysler Motor Parts Corporation has two other distinct functions besides that of stocking parts. These functions are manufacturing of parts and distribution.

The majority of all Chrysler Motors service parts are made by the parts corporation in a plant which is modern and up to date in every



A section of the great Chrysler Motors Parts Corporation, where service parts are manufactured for all models of Plymouth, DeSoto, Dodge and Chrysler

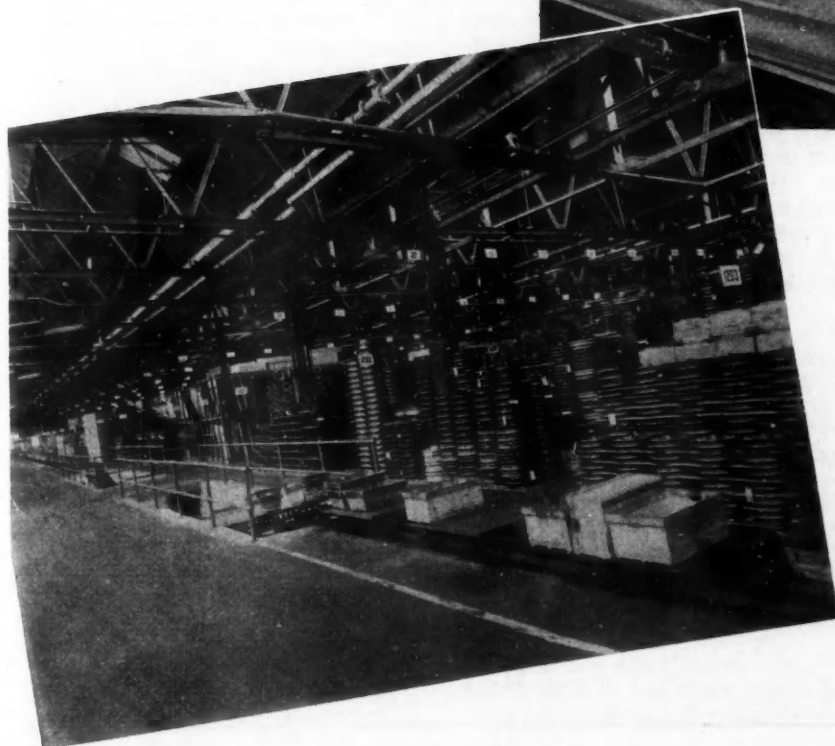
c Messenger r Parts

respect. There are complete manufacturing departments for generating gears, pressing and stamping of fenders and other sheet metal parts.

The cylinder block department includes machinery for milling, boring, drilling, cylinder lapping, block and dynamometer testing. Equipment for turning out pistons, camshafts, crankshafts, connecting rods and other parts is just as complete.

Tool, die, jig, fixture inspection, gage specifications and engineering standards are held to the same limits of precision as used in making the original parts of the car.

At the top of the page is shown one of the picking stations to which Chrysler parts orders are distributed upon receipt. Stock pickers are shown assembling parts orders



System — efficiency — economy — accuracy — speed converge here in the shipping department of the Chrysler Motors Parts Corporation, where two parts orders a minute come and go every working day

In a space 1320 ft. by 410 ft., millions of parts like these are stacked row on row to supply two million Plymouths, DeSotos, Dodges, and Chryslers—all models

Wheeler No-Back for Up-Grade Starting

STARTING a car on an up-grade is bothersome even to the best of drivers and difficult for the novice. Various devices designed to facilitate starting under such conditions have been proposed, and some actually have come into use to a certain extent. Several years ago a well-known make of car in the higher-price range appeared at the New York show with a device of this kind. This was supplied as standard equipment for some time, but later it was discarded again.

The device herewith illustrated is the invention of Phillip R. Wheeler of Alexandria, Va. It was developed by him after a study of previous devices and of the existing patent art. Mr. Wheeler observes that while theoretically any type of one-way clutch can be placed on the drive shaft or on the transmission counter-shaft, there are many points that need consideration.

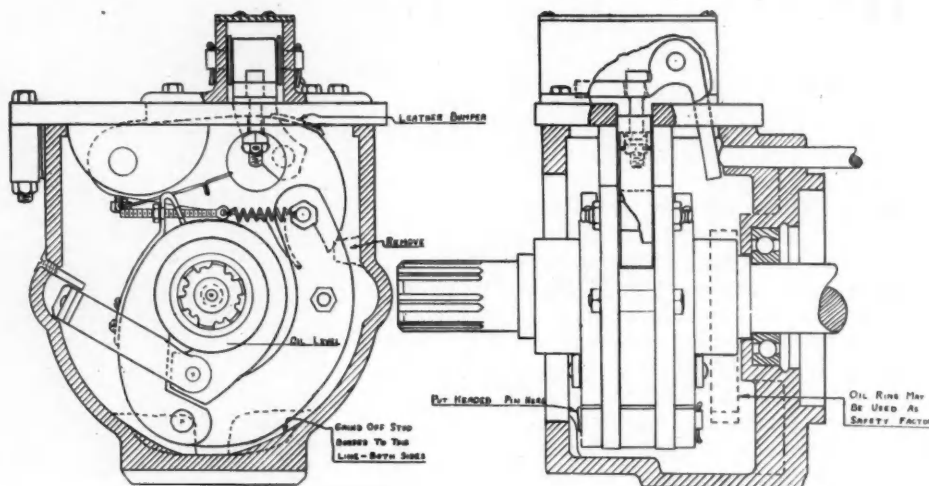
The Wheeler "no-back" is based on the use of a clamp-ring type of one-way clutch. When used for a "no-back," as shown, it is effective in all forward speeds and in neutral. It is entirely automatic in operation. The shift into reverse can be easily made.

We understand that the use of the clamp-ring clutch as a "no-back" for a free-wheeling unit and for ratchet devices has been protected by several patent applications.

The sketches reproduced herewith illustrate the mode of operation of the device.

In Fig. 1 the shaft is turning forwardly, and the shear of the oil film between shaft and clamping exerts a pressure on the lever arm at A in the direction indicated by the arrow. This causes the lever to exert pressure on the two pins in the directions indicated, thus opening the clamp ring.

When the shaft comes to a stop, the oil film is partly



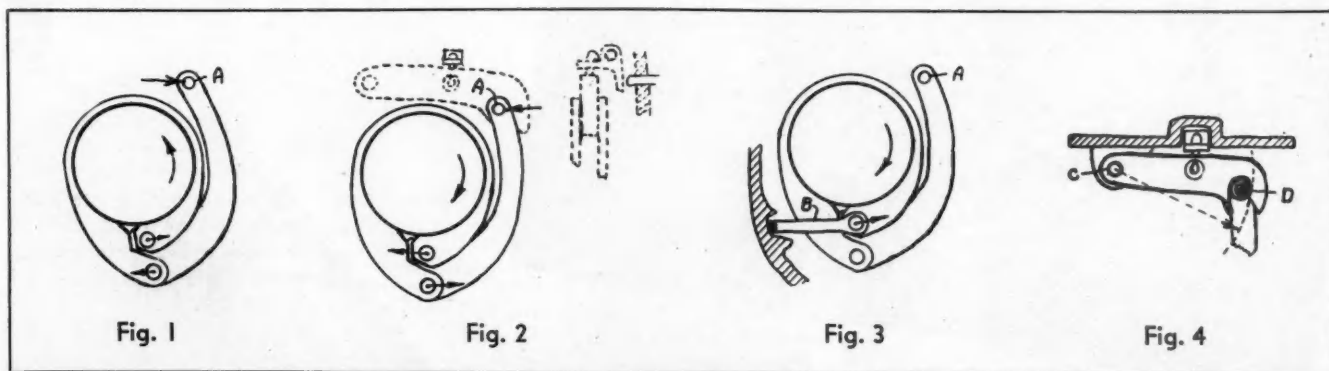
squeezed out by the initial tension of the ring, which latter is provided with grooves to allow the oil to escape. Any tendency of the car to back up causes a pressure at A and forces on the pins as indicated in Fig. 2. This locks the ring to the shaft.

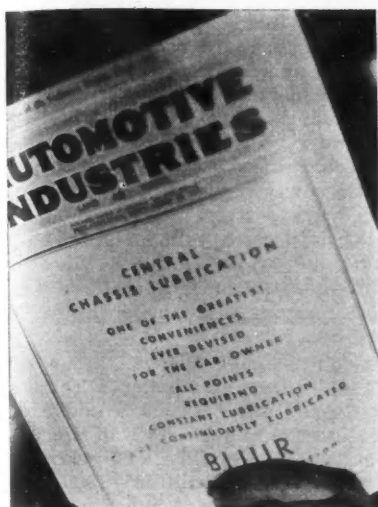
Shifting from neutral to reverse releases end A of the lever arm, and the clamp ring then rotates about $\frac{1}{8}$ in. with the shaft, until the U-shaped member B comes in contact with the housing. This holds one end of the ring, which opens as the shaft continues to turn backward. (Fig. 3.)

The device remains inoperative when shifting from reverse to neutral, but becomes operative again when shifting from neutral into low forward speed.

As shown in Fig. 4, the stop arm is held to ears on the housing by pin C. Surface D, which engages the lever-arm roller, is an arc of a circle whose center is on the axis of pin C. When shifting to reverse, the stop arm is lifted, thereby releasing the roller and lever end. Lifting the stop arm is said to require little effort even though the device may be holding the car on a steep hill.

Fig. 5 shows the Wheeler device installed on the Chevrolet transmission, in the housing at the rear end, from which the free-wheeling unit has been removed.





The Forum

Causes of Front End Vibration

EDITOR, *Automotive Industries*:

In all references to front-end nervousness one factor in particular seems to have been neglected. The gyroscopic forces, wheel unbalance, frame torsional resilience, caster angle and distance from center of tire contact to steering axis have been considered together with many other details, but no mention has been made of the effect of relative motion between front axle and frame on the steering system.

On most cars with longitudinal semi-elliptic springs, the springs are pivoted at the front and shackled at the rear, so that in forward braking the springs are stressed in tension. As a result, when the front springs are deflected, the steering arm ball describes a path which is approximately the arc of a circle with the center at the front end of the nearer front spring.

On the other hand, the front end of the drag link, which is fastened to the steering arm ball, describes a path which is the arc of a circle with the center at the steering gear arm ball. For these paths to coincide, either the steering arm or the steering gear ball arm, or both, must move.

The result is that when the front springs are deflected, either by brake application or road shock, the front wheels are turned and the reaction is felt in the steering gear. This action is reduced by pivoting the front springs at the rear, nearer the steering gear ball arm, but not eliminated, since the steering gear arm ball and the spring pivot are not coincident, and, due to the bending of the front spring, the path of the steering arm ball is not exactly the arc of a circle.

The stiffness of the front springs,

front tire air pressure, steering system geometry, and weights of front-end parts, as well as many other factors, determine the behavior of the front-end system.

When oscillation does occur, the energy to maintain it is derived from the forward motion of the car by the turning of the front wheels. The front springs are deflected, which, through the above described effect, causes the turning of the wheels.

If the front springs are omitted, as is possible with large-section, low-pressure tires, this form of oscillation cannot occur, although other less common forms may be encountered.

ALFRED P. STEENSEN.

Temperature Control — High Compression

EDITOR, *Automotive Industries*:

Recent improvements in anti-knock qualities of fuels are enabling engineers to take advantage of the benefits of high compression. These advantages have been incorporated in the current Hudson and Essex cars and are responsible to a large degree for the performance characteristics of the cars so notably illustrated in the Terraplane.

The compression ratio of the standard Terraplane engine is 5.8 to 1, and a special head known as the super power dome is available with a ratio of 7.1 to 1.

Even the standard 5.8 to 1 ratio is considerably above the average and consequently entails some design features which are necessary to secure smoothness of operation in spite of the increased energy developed in combustion.

Proper forming of the combustion chamber to give the proper degree of turbulence or agitation of the charge at the time of ignition and proper temperature control are two vital factors in the design of a high compression engine.

When the owner looks at his temperature gage and notes that it registers 160 to 180 deg. or somewhere near

the center of the "running range," he is satisfied. But, to the engineer this water outlet temperature does not mean anything unless he knows that the water passages about the engine are so designed that there are no hot pockets anywhere which could cause detonation or knocking.

The amount of water around each part must be determined so that there is neither over-cooling nor under-cooling and as the compressions go up this feature becomes more and more important because hot spots with high compression mean rough engines due to detonation.

Before an engine is released for production, the cooling water temperature at every vital point must be known. Thermometers are placed in the water passages at many points, and the engine is run under load on the dynamometer, when simultaneous temperature readings can be taken.

Control of the water volume and velocity is secured by properly arranging the pump capacity as well as the form and size of the water passages. Uniform temperature conditions must prevail around every cylinder, if maximum smoothness is to be obtained.

STUART G. BAITS,
Chief Engineer,
Hudson Motor Car Co.

Independent Suspension

EDITOR, *Automotive Industries*:

The table compiled by Mr. Jules Haltenberger which accompanies the article by Mr. P. M. Heldt in *Automotive Industries*, July 30, gives a misleading picture of developments in independent springing so far as British cars are concerned.

It is stated that this feature is embodied in B.S.A., Derby, Hampton, Rover and Burney cars. I would point out, however, that the Derby is not a British make, but French, that the B.S.A. independent suspension was conceived for a three-wheeled runabout classified here as a motor-cycle, that the Hampton is a make with a very small output, even on

British standards, and apart from experimental chassis has been of orthodox design hitherto, and that the Rover independently sprung car was an experimental air-cooled runabout that never went into production.

The Burney is the only "real car" in production among those mentioned, and even this has been produced so far in very small numbers; it certainly does not indicate a trend—pending or current—of British practice.

The Alvis, I note, is not mentioned in the table; a few cars of this make have been made with independent springs and front wheel drive, but mainly for racing. Chassis of orthodox design, however, constitute very nearly 100 per cent of the Alvis output.

Naturally, in view of the foregoing, British readers are wondering whether the list of Continental cars in the table is as little indicative of the alleged trend toward independent springing on this side of the Atlantic. It certainly cannot be said that there is any trend in this direction in England.

M. W. BOURDON,
British Correspondent,
Automotive Industries.

Is the Schliha Engine New?

EDITOR, *Automotive Industries*:

Joseph Schaeffers in the Oct. 8 issue of *Automotive Industries* fails to refute a single point of my communication in your July 2 issue and prefers to offer a few elementary issues outside of the claims I made.

The so-called new design was obsolete in December, 1906; it was condemned for the reasons I cited, after serious consideration, and it was abandoned. "Charge transfer and exhaust conditions present another hopeless situation," and that is definitely pointed out in the last paragraph of my letter of July 2. The statement is too evident to be ignored.

Mr. Schaeffers says "it is easy enough to control the inertia force after the exhaust gas has left the cylinder." How does he propose to do it? Terminal pressure must be uni-

form, and fuel distribution is the deciding factor with respect to initial pressure and mean effective pressure. Exhaust inertia can be utilized if uniform.

It must be uniform to insure uniform charging; if it is not uniform, erratic power impulses and "torsional jerks" are certain. Accurate valve timing is necessary in an automobile engine, and variables due to vile carburetion are too evident, and variables in back pressure complete failure in charging.

Joseph Schaeffers says "a smooth exhaust of proper diameter, with easy or no bends and between 5 and 6 ft. long, intensifies the effect of the inertia force." Dugald Clerk refers to a Crossley engine built in 1880. The desired delay in the production of the vacuum was brought about by attaching an exhaust pipe about 65 ft. long.

It would seem that Mr. Schaeffers should make his exhaust pipe about ten times as long as he proposes to control the inertia force.

The issue is—is this Schliha design new, is the basic principle new? It is not! It is identical with a design that was considered in 1906 and abandoned then.

JAMES MCINTOSH.

Canada Has Valuable Alloy Metals But Industry is Undeveloped

CANADA expects to share some of the benefits that will accrue from industry's increasing demand for metal alloys, according to a Canadian Pacific Railway bulletin. Canada possesses deposits of many of the leading alloy metals, it was pointed out, and although comparatively little development has taken place thus far, the resources are available for the building of a strong branch of Canadian industry along these lines.

Among the leading alloy minerals of which the Dominion possesses deposits are chromite, lithium, manganese, molybdenite and tungsten, while in related fields of industry beryl, cadmium and selenium recently have received special notice.

Considerable research has been conducted in the field of commercial utilization of the metal beryllium, especially in the light alloy field. The principal ore of beryllium consists of the mineral beryl. There are several known occurrences of this mineral in Canada, and shipments have been made for experimental purposes from deposits in Renfrew County, Ontario, and from the Oiseau River areas in Manitoba.

Cadmium is produced in British Columbia as a by-product in the production of refined zinc by the Consolidated Mining & Smelting Co., the value of the output in 1931 being \$180,958.

The Hudson Bay Mining & Smelting Co. produced and stored 2166 tons of cadmium precipitate last year, to be treated during the present year. Cadmium has a strong position as a plating metal, espe-

cially in the automobile industry. The metal also is used in silver, gold, copper and fusible alloys, and in the manufacture of pigments.

There was no production of chromite in Canada in 1931. The Consolidated Smelters suspended operations on their Flint chromite claims near Ashcroft, B. C., but acquired an adjoining claim with good surface indications. Chromite also occurs in Ontario and Quebec, and a considerable tonnage was produced for some years in the eastern townships.

Lithium recently has come into prominence in Germany as an alloying metal with lead and calcium for use in bearing metals on the state railways. It has begun also to attract attention in the United States as an alloying element with lead and aluminum and as an oxidizing agent for copper. Lithium-bearing minerals are reported to occur in commercial quantities at Lac du Bonnet in the southeastern part of Manitoba, and shipments have been made from these deposits for experimental purposes.

One hundred and seventeen tons of manganese, valued at \$2,893, were produced in Canada in 1931. That year's output consisted of high-grade concentrates from the Dean, Chapter and Cain properties at New Ross, Nova Scotia, and crude ore from Turtle Creek in New Brunswick.

Shipments from the Nova Scotia deposits were consigned to Cologne, Germany, for experimental purposes; the output from New Brunswick went to an electro-metallurgical plant in Ontario.

BOOK REVIEWS—

Dispersion of Oil Sprays

On the Formation and Dispersion of Oil Sprays, by Kalman J. DeJuhasz, O. F. Zahn, Jr., and P. H. Schweitzer. Engineering Experiment Station Bulletin No. 40 of Pennsylvania State College, State College, Pa.

CONSIDERABLE experimental work on the formation and dispersion of fuel sprays has been done at Pennsylvania State College for a number of years past, and some information on the methods used and the results obtained has been made public in papers presented at National Oil Power Conferences of the American Society of Mechanical Engineers. In the present bulletin the experimental work is covered comprehensively and the subject is also investigated by theoretical methods. In connection with the analytical work considerable use is made of the theory of dimensions. By the application of this theory to the phenomenon of flow through tubes, a relation is established between the pressure drop per unit of length, the Reynolds number, the kinematic viscosity, the density and the diameter of the tube.

Experiments at State College have shown that the flow of heavy oils through an orifice under pressure does not generate electricity, and electric repulsion therefore is not a factor in the dispersion of the spray.

Very extensive experiments were made on spray formation, the liquids employed ranging from water to glycerine, and including, of course, also a number of petroleum products. The changes in shape of the jet from a nozzle with increase in the pressure on the nozzle are discussed, and experiments were made to determine the effects of nozzle construction, viscosity, and surface tension on the break-up distance, that is, the distance from the mouth of the nozzle to the point where the jet breaks up into a spray.

Some work was done in determining the drop sizes of oil sprays, and in this the method of Woeltjen was followed, the fuel being sprayed into a receiving liquid which held the droplets in suspension so that they could be measured and counted.

A considerable portion of the bulletin is devoted to a study of the dispersion of spray. A number of special instruments and auxiliary apparatus were developed for the investigation of various spray characteristics. The spray is directed into a steel chamber and on the inside face of the chamber cover there is mounted either a discharge cup for measuring the total discharge of the orifice, or a dispersion rack for catching portions of the spray at definite locations in space. The discharge cup is a small aluminum receptacle filled with some absorbent material such as cotton waste. The dispersion rack has a number of absorbing pads for intercepting the spray at a number of predetermined locations in space. The amount of spray caught by either the discharge cup or by the absorption pads is determined by weighing. Thus the dispersion of the spray under given conditions can be accurately studied and the effects of various factors on the dispersion determined. Numerous dispersion charts are included in this section of the bulletin. They show the specific flux values, or weight of spray per unit solid angle, at distances of 3.5, 7, 10.5 and 14

in. from the nozzle; the iso-flux lines, and the percentage of total discharge passing through a circular area coaxial with the spray. It was found that the dispersion in a given cross section becomes more nearly uniform as the distance from the nozzle, the air density, and the oil pressure are increased, and as the oil viscosity is decreased, and that the percentage of the total spray which reaches a given cross section increases as the distance from the nozzle, the air density and the oil pressure decrease and as the oil viscosity increases.

The bulletin contains four appendices: One on the Mechanism of Disintegration, by P. H. Schweitzer; a second on Spray Dispersion Considered as a Phenomenon of Probability, by Kalman J. DeJuhasz; a third on Practical Suggestions with Regard to Spray Dispersion in Fuel-Injection Engines, by P. H. Schweitzer, and Bibliography of Liquid Jets, Sprays and Nozzles, Especially for Oil Engines.

The New Necessity

"The New Necessity, by Charles F. Kettering, Williams & Wilkins, Baltimore. (Century of Progress Series.)

IF by any chance it never has been your good fortune to hear Charles F. Kettering, vice-president of the General Motors Corp., speak, the next best thing is to peruse a 124-page booklet he has written in collaboration with Allen Orth of the General Motors Research Laboratories, entitled "The New Necessity."

It traces briefly the highlights in the evolution of the automobile industry. In it are to be found "Ket's" famous stories including those of the automobile under a hermetically sealed glass bell, the story of the evolution of Duco, etc.

To those who have heard Mr. Kettering, the first few chapters will be familiar ground. The last chapter, however, "The Public Pulse," should be worth the whole book. In it Mr. Kettering summarizes his philosophy of progress. If he branches out into other than automotive fields, it serves the better to fix more clearly the author's ideas of the place the automobile has and will have in the future of our lives.

Mr. Kettering's ideas as to "standardization" are particularly interesting at this time. In his opinion standardization should continue but "without building fences to prevent development or to block future progress. Today," he says, "there is a tendency to drift too far in the other direction—some of our engineers have a standardization complex. People are obsessed with the fallacy that if we standardize everything the millennium is upon us. . . . Standardize materials, but never submit to the standardization of ideas."

A BOOK on Taurus Bronze for Worm Wheels has been published by David Brown and Sons (Hudd), Ltd., Huddersfield, England. It deals with the composition, properties, manufacture and application of bronze castings for engineering purposes, and contains an illustrated commentary on the control, manufacture, testing and application of Taurus bronze castings.

Automotive Oddities—By Pete Keenan



Write us if you know an oddity

The NEWS TRAILER

Henry Dreyfuss, author of a recent article in *Automotive Industries* and creator of scores of Broadway productions, will design the Plymouth exhibits at the New York and Chicago shows.

Seagulls, like goats, crave a varied diet. British navy aircraft officers are trying to prevent seagulls from pecking holes in aircraft wings to eat the doped fabric, a bit of savory—not without alcoholic content.

On Nov. 3, 1911—just 21 years ago—the Chevrolet Motor Co. was incorporated in Michigan. The first car ever to carry the name "Chevrolet" came out of an upstairs flat converted into a workshop in Detroit, and now, a generation later, the name has decorated more than 8,000,000 radiators of cars and trucks throughout the world.

Long before the dawn of European history, the idyllic Tsu-Shuen laboriously penned his way to

literary fame with strident verses about fantastical adventures of his patron, the Emperor of China.

He wrote of the "winged tray"—an ancestor of the idea of the flying carpet of Bagdad—which carried the venerable Son of Heaven through the clouds. This week comes a news item about the completion of the Lungwha airport, situated near the town made famous by the imagism of the poet of long ago.

Motorized big-game hunting in South Africa is all off. Northern Rhodesia has passed a law, reading in part: "... no person shall approach, in a motor car or aeroplane to within 500 yards of a game animal for the purpose of hunting, killing, capturing ... or use such conveyances to drive or stampede game ... or shoot from such conveyance ..." Cars and aircraft will still be used on the long "Safari" to the hunting grounds, however.

Physicians, 816 of them in 471 places, have examined 164,967 applicants for student permits and licensed pilots in the United States.

October 29, 1932

Automotive Industries

NEWS

Chrysler Broadcast Is "Sales Round-Up"

Simultaneous Meetings in 75 Key Cities Planned to Present Campaign to 75,000

DETROIT, Oct. 24—Plans for the most novel use of radio were announced in New York today by Walter P. Chrysler when he told of his intention to hold an international meeting of DeSoto, Dodge and Chrysler dealers by means of a two-hour broadcast.

Speaking from New York on Nov. 1 over the Columbia network, Mr. Chrysler and other executives of Chrysler Motors will address more than 75,000 persons concerned with the sale of Plymouth cars in practically every large city of the United States and Canada. Meetings will be held in twenty-five key cities.

Business plans and prospects for 1933 will be the trend of the talks. The program, Mr. Chrysler said, will take the place of a regular business meeting of Plymouth dealers and will serve to acquaint them with the new 1933 Plymouth Six.

William S. Paley, president of Columbia Broadcasting System, said the program will be the first of its kind to be undertaken by any business corporation.

In addition to Mr. Chrysler, other speakers will be Fred M. Zeder, vice-president in charge of engineering of Chrysler Corp.; B. E. Hutchinson, chairman of the board, and H. G. Moock, general sales manager of Plymouth Motor Corp.

Murray Corp. to Rehire 1200 Men; Orders Up

DETROIT, Oct. 26—C. D. Widman, secretary-treasurer of the Murray Corp. of America, announced that the company last week rehired 1200 employees and increased its payrolls about \$50,000 a week.

This move was made necessary, Mr. Widman said, in preparation for the production of new 1933 models by the various automobile concerns.

About 1000 of the workers are in the tool department where dies and fix-

tures are being changed to fit 1933 designs.

The other 200 are directly on production for Dietrich, Inc., the corporation's division devoted to building custom-made automobile bodies.

88% of White Stock Deposited in Merger

Erskine Sends Letter to White Holders in Studebaker Corp. Deal

SOUTH BEND, Oct. 24—A. R. Erskine, president of Studebaker Corp., has sent a letter to stockholders of the White Motor Co., informing them that holders of more than 88 per cent of White Motor stock had deposited their stock under the merger offer from Studebaker Corp. by Oct. 18, and that the merger consequently has been consummated.

He extended an offer to holders of the remaining shares of White Motor not deposited to deposit their holdings under the same terms on or before Nov. 10, 1932.

Remaining White Motor stockholders who deposit their securities will receive interest at the rate of 6 per cent per annum on \$25 from the date of deposit for exchange to Dec. 1.

(See page 566 for Studebaker-White personnel changes.)

Duesenberg Orders Reach \$125,000

INDIANAPOLIS, IND., Oct. 26—An about-face in the public's buying attitude is indicated with the announcement here today by Duesenberg, Inc., of retail orders for Duesenberg custom-built motor cars in the last 10 days totaling more than \$125,000. This volume is equal to orders for approximately 200 low-priced cars, according to H. T. Ames, president.

Toledo Employment Gains

TOLEDO, OHIO, Oct. 26—Employment almost doubled here since the last week in August.

A survey showed 13,427 workers on payrolls now compared to 7000 at the end of August.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

NEW YORK, Oct. 27—The falling off of commodity and security prices in recent weeks is an evidence of an absence of a speculative attitude, and what optimism exists is of a conservative nature. Seasonal retail trade last week continued at about recent levels.

A fair business was reported in electrical supplies, furniture, and other household goods. The most favorable feature in the current situation is the activity in textiles.

Mills in New England and the South are very busy, and some of them have found it necessary to work night shifts.

FOOD PRICES

Retail food prices in the United States on Sept. 15, according to the Bureau of Labor Statistics, averaged about $\frac{1}{2}$ of 1 per cent below those a month earlier and about 16 per cent below those a year earlier.

RETAIL SALES

Sales of department stores in the Metropolitan area of New York during the first half of October, according to the Federal Reserve Bank of New York, were 13.9 per cent below those in the corresponding period last year.

RAILWAY LOADINGS INCREASE
Railway freight loadings during the week ended October 8 continued to increase. The total stood at 625,636 cars, which marks an increase of 3561 cars above that during the preceding week, but a decrease of 138,182 cars below that a year ago and a decrease of 329,146 cars below that two years ago.

EMPLOYMENT UP

Employment in 15 industrial groups in the United States during September, according to the Bureau of Labor Statistics, increased 3.6 per cent above that in August, and total payrolls increased 2.6 per cent.

EXPORTS UP

Exports during September totaled \$132,000,000, as against \$109,000,000 during August and \$180,228,000 a year ago. Imports totaled \$98,000,000 as against \$91,000,000 and \$170,384,000, respectively.

FISHER'S INDEX

Professor Fisher's Index of wholesale commodity prices during the week ended Oct. 22 stood at 61.1, as against 61.3 the week before and 61.8 two weeks before.

BANK DEBITS

Bank debits to individual accounts outside of New York City during the week ended Oct. 19 were 22 per cent below those a year ago.

STOCK MARKET

The stock market continued depressed last week, with irregularity during the first part of the week giving way to pronounced weakness on Friday. The continued decline in commodity markets, particularly in wheat and cotton, was the only important development.

The break in sterling was an unfavorable development, but it is not believed to have been a serious depressing influence.

Willys Sees Improvement

TOLEDO, Oct. 25—John N. Willys, chairman of the board of Willys-Overland Co., is looking forward to improved automobile business in 1933, he told members of the board at their regular monthly meeting.

Only routine business was discussed.

Studebaker Reports Loss of \$1,989,398

**Erskine Announces New
Executive Personnel of
Merged Corporations**

SOUTH BEND, Oct. 25—Report of Studebaker Corp. and subsidiaries, including Pierce-Arrow Motor Car Co., for the quarter ended Sept. 30, shows a consolidated net loss of \$1,989,398 after depreciation, interest, taxes, minority interest, etc.

This compares with net loss of \$1,917,015 in preceding quarter and net profit of \$466,770, equal, after Studebaker Corp. preferred dividend requirements, to 18 cents a share on 1,961,413 no-par shares of common stock, including 56,368 shares held in treasury, in September quarter of previous year.

For nine months ended Sept. 30, 1932, consolidated net loss was \$4,390,538 after taxes, charges and Pierce-Arrow preferred dividends comparing with net profit of \$2,496,125, equal to \$1.09 a share on common stock in first nine months of 1931.

Consolidated statement of Studebaker Corp. and subsidiaries, including Pierce-Arrow Motor Car Co., as of Sept. 30, 1932, shows total assets of \$72,252,674, comparing with \$112,630,209 on Sept. 30, 1931. Current assets, including \$4,684,341 cash, amounted to \$20,330,975 and current liabilities were \$9,645,557, comparing with cash of \$8,022,680, current assets of \$25,556,597 and current liabilities of \$4,409,267 on Sept. 30, 1931.

Robert W. Woodruff, chairman of White Motor Co., A. G. Bean, president, George H. Kelly, vice-president and treasurer, and Homer H. Johnson, a director of White, have all been elected directors of Studebaker Corp. Mr. Woodruff and Mr. Bean have also been elected members of the Studebaker executive committee.

Mr. Kelly has been appointed vice-president in charge of finance for the Studebaker, White and Pierce-Arrow companies and will continue as president of White Securities Corp., the financing subsidiary of White Motor. T. R. Dahl will continue as vice-president of White Motor and has been appointed assistant to the president of Studebaker Corp. in addition to K. B. Elliot, acting in a similar capacity.

White Motor will continue to manufacture and market its present products under the direction of its present management, with Mr. Bean as president. A. R. Erskine, president of Studebaker Corp., has been elected chairman of White Motor.

Mr. Erskine, in notifying stockholders of the consummation of the White merger, submitted a balance sheet for White as of Sept. 30, 1932, showing current assets (including cash, U. S. government and municipal securities of \$8,828,587), of \$20,487,591 and current liabilities of \$1,483,647, leaving

working capital of \$19,003,944.

On June 30, 1932, White's current assets, including \$8,911,930 in cash and U. S. Government securities, totaled \$21,500,288 and current liabilities were \$1,472,367, with working capital totaling \$20,027,921.

Net tangible assets of White Motor on Sept. 30, totaled \$32,272,845, exclusive of reserves. On June 30, net tangible assets excluding reserves and treasury stock, totaled \$33,423,159.

Houdaille-Hershey Reports

CHICAGO, Oct. 25—Houdaille-Hershey Corp. reports for the nine months ended Sept. 30, net loss of \$296,114 after charges but before dividend requirements of \$90,000 on the Class A stock of its subsidiary, Muskegon Motor Specialties Co. For the corresponding period last year, the company reported consolidated net profit of \$486,328, equal after dividends on the A stock of the subsidiary and the Houdaille corporation to 10 cents a share on 784,976 no par shares of class B stock.

Stewart-Warner Reports Loss

CHICAGO, Oct. 25—Stewart-Warner Corp. reports net loss for the quarter ended Sept. 30 of \$660,161, after taxes and charges, as compared to net loss of \$487,173 in the preceding three months and \$791,496 in the third quarter of 1931.

Yellow Truck & Coach Earnings For Nine Months

PONTIAC, MICH., Oct. 25—"Net sales of Yellow Truck & Coach Mfg. Co. for the nine months ended Sept. 30, 1932, were \$13,271,618," Paul W. Seiler, president, announced today. "Net loss after provision for depreciation was \$2,343,919. In the nine months ended Sept. 30, 1931, the company reported a net loss of \$1,893,352."

The quarter ended Sept. 30, 1932, showed a net loss of \$1,050,822. This compares with a net loss of \$846,471 in the third quarter of 1931.

Studebaker Pays \$1.75

CHICAGO, Oct. 25—Studebaker Corp. directors declared the regular quarterly dividend of \$1.75 a share on the preferred stock today. Directors of the Chicago Board of Trade today approved an application by the Studebaker Corp. to list 538,587 additional shares of common stock issued for the purpose of acquiring the White Motor Company. Trading in the shares begins Friday.

British Approve Ottawa Agreement

LONDON (Special)—The House of Commons approved the Ottawa financial resolutions and then passed the Ottawa agreements bill, to make effective the tariff agreements of the Imperial Conference, for the first time.

September Production Hits New Low Mark

WASHINGTON, Oct. 26—Automobile production in both the United States and Canada took a further drop during September, and in the case of both countries was the lowest month for the year, the Department of Commerce reports.

In the United States, output was 84,141 in September, in comparison with 90,324 for August, and 140,566 for September last year.

Passenger car output in the United States in September totaled 64,735, against 75,898 in August and 109,087 in September, 1931.

Truck production in September in the United States increased to 19,393 from 14,417 in August, and compares with 31,338 in September, 1931.

Graham-Paige Cuts Stock

DETROIT, Oct. 24—Stockholders of the Graham-Paige Motors Corp. voted today to reduce authorized capital from \$7,000,000 to \$5,516,000.

The 30,000 shares of first preferred stock \$100 par, 40,000 of second preferred \$100 par and 2,500,000 of common no par are to be succeeded by 30,000 shares of first preferred, 165 of second preferred and 2,500,000 of \$1 par common.

The reduction of \$1 par of the no-par common stock will result in a transfer to capital surplus, against which will be applied the deficit from operations accumulated to Dec. 31.

General Aviation Elects

WILMINGTON, DEL., Oct. 25—At a meeting of the stockholders of the General Aviation Corp., here today, the following directors were elected: Ernest R. Breech, Fred J. Fisher, A. H. G. Fokker, Harris M. Hanshue, H. M. Hogan, James M. Schoonmaker, Jr., John Thomas Smith, Edward R. Stettinius and C. E. Wilson.

Briggs & Stratton Quarter Net \$3,773

NEW YORK, Oct. 26—Briggs & Stratton Corp. reports for nine months ended Sept. 30, net profit of \$17,817 after charges and taxes, equivalent to 6c a share on 300,000 no-par shares of stock. This compares with \$328,493, or \$1.09 a share in first nine months of previous year.

For quarter ended Sept. 30, net profit was \$3,773 after charges and taxes, equal to 1c a share comparing with \$5,085 or 2c a share in preceding quarter and \$8,451 or 3c a share in September quarter of 1931.

Current assets as of Sept. 30, 1932, including \$1,566,609 cash and marketable securities, amounted to \$1,977,059 and current liabilities were \$75,170. This compares with cash and marketable securities of \$2,017,825, current assets of \$2,471,232 and current liabilities of \$245,502 as of Sept. 30, 1931.

G. M. Earns \$10,555,175 in 9 Months, Equivalent to 8c. on Common Stock

Third Quarter Loss is \$4,464,229; Nine Months Deliveries Total 450,347 Units, Compared With 800,234 for 1931 Period

NEW YORK, Oct. 26—Net earnings of General Motors Corp., including equities in the undivided profits or the losses of subsidiary and affiliated companies not consolidated, for the nine months ended Sept. 30, amounted to \$10,555,175. This compares with earnings of \$97,455,390 for the corresponding nine months of last year.

After deducting dividends of \$7,032,622 on the preferred stock, there remains \$3,522,553, being the amount earned on the common shares outstanding. This is equivalent to 8 cents per share on the common stock and compares with \$2.08 per share earned in the first nine months of 1931.

Operations during the third quarter ended Sept. 30 resulted in a net loss of \$4,464,229, which, after providing \$2,344,207 for preferred dividends, resulted in a loss on the common stock of \$6,808,436, equivalent to 16 cents per share. This compares with net earnings of \$13,333,214 for the third quarter of last year which, after the deduction of preferred dividends, amounted to 25 cents per share earned on the common stock.

Cash, U. S. Government and other marketable securities at Sept. 30, 1932, amounted to \$209,098,832, compared with \$205,029,119 at Dec. 31, and \$264,107,166 at Sept. 30. Net working capital at Sept. 30 amounted to \$240,411,639, compared with \$273,915,923 at Dec. 31 and \$318,526,557 at Sept. 30, 1931.

For the nine months ended Sept. 30, General Motors dealers in the United States delivered to consumers 450,347 cars and trucks, compared with 800,234 cars and trucks in the corresponding period of 1931. Sales by General Motors operating divi-

sion to dealers in the United States during this period amounted to 420,543 cars and trucks, compared with 814,959 cars and trucks in the first nine months of 1931.

The excess of deliveries to consumers over sales to dealers during the first nine months of 1932 therefore resulted in a decrease of 29,804 units in dealers' stocks in the United States, which compares with an increase of 14,725 cars and trucks during the comparable period of 1931.

Total sales to dealers, including Canadian sales and overseas shipments, amounted to 492,323 cars and trucks, compared with 939,846 cars and trucks in the corresponding period of 1931.

During the third quarter ended Sept. 30, General Motors dealers in the United States delivered to consumers 104,773 cars and trucks, compared with 206,670 cars and trucks in the corresponding quarter of 1931.

Sales by General Motors operating divisions to dealers in the United States during this quarter amounted to 78,792 cars and trucks, compared with 189,285 cars and trucks in the third quarter of 1931.

The excess of deliveries to consumers over sales to dealers during the third quarter of 1932 therefore resulted in a decrease of 25,981 units in dealers' stocks in the United States, which compares with a decrease of 17,385 cars and trucks in the third quarter of 1931.

Total sales to dealers, including Canadian sales and overseas shipments, amounted to 97,408 cars and trucks, compared with 215,649 cars and trucks in the third quarter of 1931.

E. J. Thomas, formerly assistant factory manager, was elevated to the position left by Stephens. H. T. Gillen, assistant superintendent in charge of production, was made new superintendent of Goodyear Plant Two here, and L. B. Tompkinson, now with the California plant, is to return to Akron soon to head Plant One as superintendent.

W. H. Fleming, assistant superintendent here, will replace Tompkinson in California. R. P. Dinsmore, chief chemist, is new head of research and developments of new products.

Heads Gilbert & Barker

Stanley C. Hope has been elected president of the Gilbert & Barker Mfg. Co., Springfield, Mass. He will retain his post as general manager. P. H. Bills has added the office of vice-president to his duties as treasurer.

General Tire Unit Sales Set Record

Nine Months' Total Best Yet, W. O'Neil, President, Says; Hits Higher Tariff

AKRON, Oct. 26—Unit sales and production of General Tire & Rubber Co. during the first three quarters of the fiscal year were higher than in any corresponding period in the history of the company, W. O'Neil, president, said.

"I can see no need at this time for increasing the tariff on automobile tires, as the present tariff, which is purely nominal, is sufficient.

"Although I am a protectionist," said Mr. O'Neil, "I do not like to see higher tariffs. I feel that the whole question of tariffs should be delegated to a permanent, non-political commission with full power to act. I do not believe that tariffs are properly the subject of congressional action.

"The Hawley-Smoot act taxed French lace and France retaliated with a 100 per cent duty on automobiles and automobile parts. The automobile industry in this country protested and the lace tariff was reduced but the French levy on automobile imports still remains.

"The difficulty is," Mr. O'Neil added, "that in this country we have to do our tariff trading through the agency of more than 500 men who compose the Congress. Had this problem been delegated to a group which had all the necessary authority, it could have been worked out to full satisfaction.

Ford Starts Chain Service Stations

DETROIT, Oct. 24—The first of a group of its own retail sales and service stations is being established in Buffalo, N. Y., by the Ford Motor Co.

The stations will supplement but not replace present dealer representation in the larger cities where such action is deemed necessary. The new plan is not designed to interfere in any way with the activities of present Ford dealers.

"Marketing information gained in the operation of the new retail stores will be put at the disposal of the entire Ford dealer organization," Edsel B. Ford said. "In this way it is expected that sales and service activities of Ford dealers will be intensified greatly."

General Aviation Names Directors

WILMINGTON, Oct. 25—At a meeting of the stockholders of the General Aviation Corp. here today, the following directors were elected: Ernest R. Breech, Fred J. Fisher, A. H. G. Fokker, Harris M. Hanshue, H. M. Hogan, James M. Schoonmaker, Jr., John Thomas Smith, Edward R. Stettinius and C. E. Wilson.

Peerless to Pay 50c Cash Dividend

NEW YORK, Oct. 26—Directors of the Peerless Motor Car Corp. voted yesterday to make a cash distribution of 50 cents a share payable on Nov. 10 to holders of record Nov. 5.

On May 14 a capital distribution of \$1 was made, while on April 25 a cash distribution of \$3 was paid.

Goodyear Promotes Five Executives

AKRON, Oct. 25—Five executives of the Goodyear Tire & Rubber Co. had been promoted this week as result of a reorganization of the company made necessary by the recent death of William Stephens, for many years general superintendent in charge of production.

Scoville Expects Greater Activity In Low-Priced Automobile Group

Chrysler Corp. Statistician Finds "Conflict of Desire to Buy and Ability to Pay" Favors Cheaper New Cars

DETROIT, Oct. 26—Greater activity in the lower price car market is indicated for the automobile industry, according to John W. Scoville, chief statistician of Chrysler Corp.

"Destruction of goods has been exceeding production," he pointed out. "This wearing-out process has recently caused an increase in the demand for hats, shoes and clothes."

"An automobile lasts longer than a pair of shoes, but the excess of scrapping over production will soon make itself felt in the automobile industry."

"We look to see this stimulus appear first in the low priced group, and later on appear in the medium and higher priced groups."

"Estimates indicate that retail deliveries this year will be lower than any year since 1918. The low sales for the last three years have changed in important respects the whole outlook."

"The average age of passenger cars in use at the end of 1932 will be 4.44 years, while at the close of 1929 this average age was only 3.69 years."

"While the total number of passenger cars in use will shrink more than

3,000,000 units in the three years ending with 1932, the number of cars over three years old will increase by 783,000. We may estimate the value of passenger cars in use as follows: December 31, 1929, \$6,068,000,000; December 31, 1931, \$4,422,000,000; December 31, 1932, \$3,520,000,000.

"The value of passenger cars in use at the close of 1932 will be nearly \$1,000,000,000 less than at the beginning of the year and will be about \$2,500,000,000 less than at the end of 1929."

"The preponderance of older cars will make for an excessive car mortality in 1933. The scrapping of old cars per thousand in use will probably be higher in 1933 than ever before. This will tend to create a larger demand for new cars."

"The value of the cars in use is a fund which the owners draw on to make a down payment on a new car. The need for new cars will be very great in 1933."

"So the conflict in 1933 will be between the desire to buy and the ability to pay. This conflict will work in favor of the low priced new car."

Budd Bodies Boost Citroen Car Sales

Models of Andre Citroen Have Marked Success at Paris Auto Show

PHILADELPHIA, Oct. 26—Officials of Edward G. Budd Mfg. Co. last week received a cable telling of unusual success of the new Citroen models at the Paris automobile show.

These models are largely of American designs, employing the Budd one-piece all-steel body.

The dies and first stampings were manufactured by the Budd company here and shipped to the works of Andre Citroen in Paris where production is being continued.

Mr. Citroen estimated purchases in this city at \$8,000,000 for the current year.

Houdaille-Hershey Shows Net Losses

DETROIT, Oct. 26—Houdaille-Hershey Corp. reports for nine months ended Sept. 30, 1932, consolidated net loss of \$296,114 after interest, depreciation, etc., but before dividend requirements of \$90,000 on Class A stock of its subsidiary, Muskegon Motor Specialties Co.

This compares with consolidated net profit in first nine months of 1931 of

\$486,328 after charges and taxes, equal after deducting dividends on Class A stock of Muskegon Motor Specialties Co., and dividend requirements on Class A stock of Houdaille-Hershey Corp., to 10 cents a share on 784,976 no-par shares of Class B stock outstanding, excluding 17,194 shares in treasury.

Continental to Launch Unusual Sales Program

DETROIT, Oct. 29—Possibility of some unusual departures in automobile merchandising methods is forecast in an announcement being carried in the Trade Press next week from the Continental Motors Corp. Continental Motors, in this announcement, signed by Henry Krohn, sales manager, states that it will reveal these plans and policies to interested automobile dealers and prospective dealers.

The announcement also states that while no formal announcement of its new products can be made at this time, the new car will cover price classes in which 87 per cent of all automobiles are sold.

"The new plans and policies," Mr. Krohn states, "will enable the dealer to operate on a new basis with an assured profit."

Since the first announcement of its plan to more actively enter the passenger car field, Continental Motors has received some 500 inquiries from dealers all over the country.

Alabama Defeats 3c. Gasoline Tax

Heaviest Taxed of States Fails to Pass Bill After Vociferous Fight by Motorists

MONTGOMERY, Oct. 26—Alabama, which taxes gasoline more heavily and from more sources than any other state in the Union, has rejected three proposals to increase the state gasoline tax rate to 8c a gallon from 5c.

Efforts are still being made to raise the state tax rate at least 2c, although the administration hunted long and vainly for a legislator with sufficient fortitude to introduce the three-cent increase bill in the face of violent and vociferous opposition from motorists.

Passage of the administration measure calling for an 8c state tax, would have forced motorists in some parts of the state to pay a total tax of 14c per gallon; i.e., a 1c federal tax, 8c state tax, 3c county tax, and 2c city tax.

Yellow Truck Reports Loss

PONTIAC, Oct. 25—Net sales of Yellow Truck & Coach Mfg. Co. for the nine months ended Sept. 30 were \$13,271,618, Paul W. Seiler, president, announced.

Net loss after provision for depreciation was \$2,343,919. In the nine months ended Sept. 30, 1931, the company reported a net loss of \$1,893,352.

The consolidated income account of the Yellow Truck & Coach Mfg. Co. and subsidiaries for the nine months ended Sept. 30, 1932, follows:

Net sales\$13,271,618

Loss from operations (including the company's proportion of net profits or losses of wholly owned and controlled companies not consolidated) before provision for depreciation..\$ 1,644,919
Provision for depreciation.. 699,100

Net loss\$ 2,343,919

The quarter ended Sept. 30, 1932, showed a net loss of \$1,050,822. This compares with a net loss of \$846,471 in the third quarter of 1931.

Increases Production

SPRINGFIELD, MASS., Oct. 26—United American Bosch Co. has increased its production by going on full time and calling back all its available former employees.

Ford Enters Retail Field

BUFFALO, Oct. 27—The first of a group of retail sales and service stations to be established in this city by the Ford Motor Co. will be opened on Nov. 1 at Main Street and Lafayette Avenue, according to a statement credited to Edsel B. Ford, president of the company. Locations of other stores in the group have not been decided upon.

Waukesha Forms Managing Group

Four Executives Added To Directorate, Forming Emergency Committee

WAUKESHA, WIS., Oct. 24—Directors of the Waukesha Motor Co. have been increased from five to eight at the annual meeting of stockholders, initiating a general managers' committee to take complete charge of operations at the plant during the absence of the president.

Members of this committee are Chauncey P. Ross, assistant general manager and chairman; J. E. DeLong, sales manager; J. B. Fisher, chief engineer, and Andrew S. Cronk, purchasing agent, all of whom have been named directors of the company. The four directors who were reelected are H. E. Blair, E. R. Estberg, Harvey J. Frame and Harry L. Horning.

In his report Mr. Horning stated that the company has been forced to make large write-offs due to depreciation and bad accounts. The latter have been one of the most serious problems the company has had to face, due to the bankruptcy of several of its good customers. Among them was the Fageol Motor Co., California, in which the Waukesha company had a one-third interest.

The company has lost no customers in the last five years, Mr. Horning reported, and pointed out that when business comes the concern will have it. Of the \$485,000 taken from the reserve fund last year, \$100,000 was spent in research and creating new outlets for goods.

Mr. Horning asserted that agriculture will be the first to experience a recovery of business. Next will be the motor truck industry and then other industries will follow. As he views it, he said, 1933 will be a convalescent year, 1934 will be hopeful and 1935 will be very good.

Several of the major developments of the company in the past year include a motor which develops 90 horsepower that previous to this time has developed only 60 horsepower, the CFR engine, which will soon be adopted as the international yardstick for evaluating the knock value of fuels and the rights to manufacture a new foreign Diesel engine.

The company, Mr. Horning said, has abandoned further work on its own Diesel to manufacture the new one. Plans are also being made to market a steam engine which is based upon the principles of the Waukesha gasoline engine. The concern is employing 561 men at the present time.

Automotive Exports Off

WASHINGTON, Oct. 27—Exports of all automotive products in September were valued at \$5,258,269, a decrease of \$294,544 or 5.3 per cent from those of August and \$4,689,031 or 47 per

cent under total of Sept., 1931, reports Department of Commerce.

Notwithstanding the decline in all automotive products, however, car and truck shipments in September of this year were valued at \$2,661,180, or \$211,752, or 9 per cent over August.

O'Neil Predicts Price Increase

General Tire Head Sees New Schedules As Rubber Rises

AKRON, OHIO, Oct. 25—William O'Neil, president, General Tire & Rubber Co., predicts another general increase in the prices of automobile casings and tubes as result of rises in crude rubber and other raw material prices.

Returning to Akron this week from a trip through the Middle West, Mr. O'Neil said, "Any increase in the price of crude rubber will mean another increase in the prices of tires. At present there is a surplus of rubber, but it will not last long once demand comes back to normal."

O'Neil said his company had found no lessening in the demand for tires, that General had made and sold more tires in the first three quarters of the present fiscal year than during the same period a year ago.

Sun Oil to Pay Extra Dividend

PHILADELPHIA, Oct. 25—Directors of the Sun Oil Co. today declared an extra dividend of 3 per cent on the common stock in addition to the quarterly dividend of 25 cents a share.

The extra dividend is the first declared since 1930. The regular dividend of \$1.50 a share on the preferred stock also was declared.

28 States Show Rockne Seventh

DETROIT, Oct. 27—Rockne Motors Corp. registrations in 28 states for September show Rockne in fourth place in four states and fifth in two more, according to George M. Graham.

"While September registrations are not complete, Rockne stands in seventh place for all 28 states and the District of Columbia that have reported to date," Mr. Graham said.

Trico Products Shows Profit

NEW YORK, Oct. 27—Trico Products Corp. reports for quarter ended Sept. 30, net profit of \$144,152 after charges and taxes, equivalent to 38 cents a share on 374,991 no-par shares of unrestricted stock.

This compares with \$244,145 or 65 cents a share in preceding quarter and \$329,194 or 88 cents a share in third quarter of previous year.

Body Sheets Down 40%

Cut of 7% in Rail Price Recalls Big Slice in Decade

NEW YORK, Oct. 27—No noteworthy change took place this week either in the rate at which the automotive industries were calling for steel or in general conditions surrounding the steel market.

Downward revision in the price of steel rails to the extent of \$3 a ton was without any effect on the market for other steel products, rails always having been in a class by themselves. Moreover, the new base price of \$40 for rails denotes a much more moderate recession from the post-war high than has been the case in the descriptions of rolled steel used by automotive consumers.

Auto body stock, now selling at 2.75 cents, Pittsburgh, was quoted at 4.85 cents on Oct. 1, 1922, when the \$43 price for rails, which endured until this week, went into effect.

At that time the base price for body stock pertained to 22-gage, while now it applies to 20-gage material, but after allowance is made for this, there is still to be recorded a drop of 40 per cent in the price of body stock, while the \$3-per-ton cut in the price of rails denotes a reduction of only 7 per cent.

Pig Iron—Less activity is noted in nearly all markets. Prices are unchanged. Aluminum—Automotive buying is backward. Prices are unchanged.

Copper—There were sellers at 5.50@5.75 cents, delivered, Connecticut Valley basis, at the opening of the week, the 5.50-cent offer applying to deliveries over the remainder of the year, and the 5.75-cent price to all positions up to March, 1933.

Tin—The sharp decline in sterling exchange caused the week's opening price for Straits tin to give way to the extent of almost ½ cent, prompt metal being quoted at 23¼ cents.

Stewart-Warner Loss

CHICAGO, Oct. 27—Stewart-Warner Corp. reports for quarter ended Sept. 30, net loss of \$660,161 after taxes, depreciation, etc.

This compares with net loss of \$487,173 in preceding quarter and net loss of \$791,496 in third quarter of previous year.

For nine months ended Sept. 30, 1932, net loss was \$1,684,094 after above charges comparing with net loss of \$1,012,315 in first nine months of 1931.

Cadillac-LaSalle Sales Up

DETROIT, Oct. 27—"Indications are that Cadillac-LaSalle sales for October will exceed the sales of either August or September," said J. C. Chick, general sales manager of Cadillac Motor Car Co.

"Our deliveries for the first 20 days of this month are well ahead of the same period in September and there is every reason to believe that the October total will exceed either of the previous two months," he said.

U. S. May Collect Gas Taxes for States

Growing Leaks Cause Consternation, Oil Conservationists Report

WASHINGTON, Oct. 26—Evasion of gasoline taxes is a growing leak from state revenues and a source of margins for price cutting and if these damages continue to increase, "the remedy may ultimately be statutory authority for collection by the Federal government at the refineries of taxes for such consignee states as desire to join in such a program."

This forecast of possible necessity of collection of all gasoline taxes by the Federal government is made in a recent report of the Federal Oil Conservation Board. It also recommended that gasoline used on farms should no longer be exempted from taxation.

Discussing the need for uniform gasoline tax laws, the Board said that "with 38 states levying taxes of 4 to 7 cents per gallon it is inequitable to exempt gasoline used by the farmer in his business of farming and to impose the tax upon gasoline used only for business purpose on city streets, as for delivery purposes and taxicabs."

Funds yielded by the tax, it was declared, should not be diverted to uses other than for the benefit of motor vehicles.

The Board consists of the Secretary of the Interior Ray Lyman Wilbur; Secretary of War Patrick J. Hurley; Secretary of the Navy Charles Francis Adams, and Secretary of Commerce Roy D. Chapin.

Dealers Order 10,732 New Plymouth Sixes

DETROIT, Oct. 26—A total of 10,732 orders for new Plymouth Sixes have been received from DeSoto, Dodge and Chrysler dealers in the United States alone since the informal announcement of the forthcoming model last week by Walter P. Chrysler, according to H. G. Mock, general sales manager of Plymouth Motor Corp.

Production on the new Plymouth Six is expected to begin at the Plymouth plant here within a few days, it was learned. Several thousand cars will be shipped in October.

Making Valve Inserts

DETROIT, Oct. 26—Wilcox-Rich Corp. has put into production insert type valve seats for automotive engines, its latest product.

Spark Plug Exports Show 15% Decline

WASHINGTON, Oct. 26—Valuation of spark plugs exported from the United States during 1929, 1930, and 1931, amounted to \$2,122,058, \$1,730,-

Faulkner Heads Pierce-Arrow Sales Corp. In Charge of Merchandising Activities



A. J. Chanter (left), first vice-president and general manager of Pierce-Arrow Motor Car Co., who announced the appointment of Roy H. Faulkner (right) as president of Pierce-Arrow Sales Corp.



BUFFALO, Oct. 26—Appointment of Roy H. Faulkner as president of Pierce-Arrow Sales Corp. and vice-president in charge of sales of the Pierce-Arrow Motor Car Co. has been announced by A. J. Chanter, first vice-president and general manager of the latter company. A. R. Erskine is president of the Pierce-Arrow Motor Car Co.

Mr. Faulkner became associated with Studebaker interests last spring when he was made vice-president of the Studebaker Sales Corp., following his resignation as president of the Auburn Automobile Co. A few months later the position of vice-president of the Pierce-Arrow Sales Corp. was given to him in addition to his Stude-

baker car merchandising duties.

From now on his whole attention will be focused on Pierce-Arrow. He assumes complete charge of the Buffalo company's entire sales organization and will be responsible for outlining the sales policies and procedures that will govern its merchandising operation.

In announcing the new appointment, Mr. Chanter said: "Mr. Faulkner assumes direction of Pierce-Arrow sales on the threshold of the most auspicious program in the history of the company."

"His outstanding record of achievement as a national automobile sales figure eminently qualifies him for conspicuous success with Pierce-Arrow."

241, and \$1,456,496 respectively.

Shipments for the first six months of the current year totaled \$674,550. The figure for 1930 was 18 per cent under that of 1929 and in 1931 the decline was 15 per cent below the 1930 total.

Lincoln Retail Sales Show 60% Increase

DETROIT, MICH., Oct. 26—Lincoln motor cars showed a sharp rise in retail sales during the first ten days of October.

The gain was looked upon as an unusually significant indication that the recent increase in public buying, which has been in evidence for several weeks, had been extended to the so-called luxury groups.

Lincoln retail sales in the first ten days of the month were 60 per cent greater than those in the same period of 1931 and 19 per cent greater than in the first ten days of September.

It was estimated that total retail sales for October would exceed those for September, if sales during the balance of the month are maintained at relatively high levels.

Schedule 2nd Drawing For Accessories at Show

NEW YORK, Oct. 26—A supplementary drawing for exhibit space in the accessory and shop equipment sections of the New York and Chicago Automobile Shows was held in the headquarters of the National Automobile Chamber of Commerce today.

"In our contacts with leaders of the automobile and allied industries, we encounter increasing confidence that 1933 will be a buying year and that the motor business will be in a position to take advantage of any trade upturn right from the start," Mr. Reeves, vice-president, N.A.C.C., said.

Ashcraft On Graham Board

Edwin M. Ashcraft, Jr., Chicago attorney, has been elected a director of Graham-Paige Motors Corp., succeeding Ray A. Graham, deceased.

William G. LaRock

William G. LaRock, assistant purchasing agent, Buick Motor Co., died in Flint on Oct. 10 after a brief illness.

Green Shows Gain in Salon Exhibits; Plain Upholstery Popular

PARIS (*Special*)—From the point of view of color, the Paris Salon, just closed, indicated more changes or displacements than real trends, according to P. H. Chase, Duco information service.

Black has regained some of the ground it lost last year, without being able yet to reestablish the supremacy it held two years ago. Among actual color families, the distribution is perhaps more general than has been the case in the years of strong trends.

The blues have not changed their position very much since last year but they have lost their place as leaders by a small fraction. The greens are the principal gainers this year and include some rather interesting hues of medium value as well as some very dark shades. Lilac, purple or bluish purples are not seen, and a stronger place had been expected for beige than is really the case.

The absence of decoration on a car no longer attracts attention since such cars are most numerous, but there is still a total absence of novel suggestions concerning car decoration. The only exception is a black car shown by Letourneur & Marchand, Parisian coach builders. The main door carried in the center a red disk about 8 inches wide, which was repeated along the side of the hood, the louvers being of the door type.

Belt moldings remain mostly in the same color as the car, and filleting is not very frequent. Metal decoration

is used soberly. When a chromium-plated belting is used, it generally carries a stripe of some bright color. Painted or filleted louvers are seen here and there, without there being a trend for this kind of decoration. On the other hand, some fenders show painted beadings.

Upholstery treatment of most cars confirmed the continued popularity of plain woolen cloth and broadcloth. Most of this upholstery was found in beige and fawn colors but, in some cases, a special effort has been made to use cloth of the same color as the car—blue, red, green.

Bedford materials seem to have lost their popularity in spite of their undoubted serviceable qualities. A reason given for this is the very fine texture of some of the dress materials used nowadays.

Pile materials do not seem to have changed their position since last year, although this year it was principally found on cars of American origin.

There were a couple of cars upholstered with a kind of crushed velvet or pile material which most probably contained rayon. It is of interest to note that the use of leather and leather substitutes has been making a slow but steady progress for automobile upholstery in France during the last few years.

The salon, however, will hardly be remembered as one of particular interest, from the point of view of either quantity or novelty.

Dominion Motors Will Build Continental Cars

Forthcoming Models, Frontenac (DeVaux), Reo Line and Rugby Trucks in Production

DETROIT, Oct. 26—W. R. Angell, president, Continental Motors Corp., announced that a contract has been made with Dominion Motors, Ltd., Toronto, for the manufacture in Canada of the new low-priced automobile to be introduced soon by Continental.

Continental Motors recently entered into a contract with this same company for the manufacture and sale in Canada of the Continental-DeVaux car marketed in Canada under the trade-name "Frontenac."

Dominion Motors is exclusively a Canadian company. Its plant at Leaside has approximately 600,000 sq. ft. of floor space covering 18.2 acres of ground and is capable of producing 1500 cars per month. It has one of the finest dealer organizations in Canada, numbering between four and five hundred.

Dominion Motors and its predecessors have been closely identified with Continental Motors for many years, having manufactured and sold in Canada over 100,000 passenger cars and commercial vehicles powered with Red Seal Continental engines.

Mr. Angell stated that the new program of his company is being pushed as rapidly as possible and it is anticipated that the new car will be in production in December.

Dominion Motors is manufacturing the Durant Model 633, the Rugby line of trucks and the complete line of Reo cars and trucks, besides the Frontenac.

Eaton Mfg. Co. Reports Loss

CLEVELAND, Oct. 26—Eaton Manufacturing Co. and subsidiaries, including Wilcox-Rich Corp., report for nine months ended Sept. 30, 1932, net loss of \$268,400 after depreciation, taxes and dividends on Wilcox-Rich Corp. Class A stock.

For first nine months of 1931, company reported net profit of \$449,205 after depreciation, taxes and Wilcox-Rich Class A dividends, equivalent to 64 cents a share on 694,470 no-par shares of common stock.

For quarter ended Sept. 30, 1932, net loss was \$284,357 after depreciation, taxes, Wilcox-Rich Class A dividends, etc., compared with net loss of \$114,966 in September quarter of 1931.

Globe Forms Canadian Plant

TORONTO, Oct. 26—Globe Petroleum Co. of Canada, Ltd., has been formed as a subsidiary of the Globe Oil and Refining Co. of Illinois.

Illinois Employment Up; Payrolls Increase

CHICAGO, Oct. 26—Industrial employment in Illinois increased 1.8 per cent in September and payrolls rose 2.6 per cent.

Reports were received from 998 Illinois factories. These gains follow an increase of 2.3 per cent in employment and 7.1 per cent in payrolls during August. The combined improvement for the two months was the best in a considerable period.

September gains in employment and payrolls were less marked than for August, but were more widely distributed throughout the state. Of the fifteen cities for which figures were compiled separately, ten increased employment and twelve expanded payrolls during the month.

Bohn Reports Loss

DETROIT, Oct. 26—Bohn Aluminum and Brass Corp. has reported net loss of \$73,693 for the first nine months of this year, compared with a net profit of \$913,060 for the same period last year.

William Stephens

William Stephens, 56, general superintendent of Goodyear Tire & Rubber Co., and a member of the Goodyear organization for 31 years, died Oct. 14 following three months of ill health.

Caywood on Trip

S. W. Caywood, vice-president of the International B. F. Goodrich Co., Goodrich export corporation, has started a journey to the Far East to survey business conditions. He will travel more than 20,000 miles before he returns to Akron.

Newton is Consultant

William Giles Newton, New Haven, has opened his office as a consulting engineer, with staff, specializing in die castings and die-casting equipment.

He has served as secretary, E. M. Gray Mfg. Co., East Orange, N. J.; president, Marf Machine & Die Casting Co., Brooklyn, N. Y.; president, the Newton Die Casting Corp., New Haven.

Hudson Exports Gain 36% For Nine Months

Third Quarter Gain is 325%; Prospects Good for 12 Months

DETROIT, Oct. 26—Exports of Hudson and Essex cars for the first nine months of 1932 show an increase of 36 per cent over the corresponding period of last year, the shipments being 2121 units, as compared with 1560.

The prospects for the remainder of the year indicate that by January 1 the gain will be considerably higher. The third quarter alone shows a gain of over 325 per cent, shipments for this year being 907, as compared with 213 for 1931.

Orders are now on hand for more than 500 cars for October shipment, which represents a material gain over last October. According to Chester G. Abbott in charge of sales, present orders indicate a total sale of 2741 cars for the first 10 months of this year as compared with 1632 for the like period in 1931. This is a gain of 67.9 per cent.

"As the industry generally is 47.9 per cent off for the first nine months of the year this represents a material gain in export position of Hudson," Mr. Abbott said.

Argentine Market Shows Improvement

WASHINGTON, Oct. 26—August sales of cars and trucks of all classes in Argentina were much improved over July, according to the Commerce Department's automotive division.

Stocks were numerically low in August, but rather high in comparison with present sales and, based on the average sales during the preceding months, are sufficient to supply the demand for several months to come, it was stated.

A seasonal improvement in car sales from September to November is anticipated. Truck sales will depend principally upon the size of the wheat and linseed crops, which promise to be fairly large; upon grain prices, which are better than at this time last year, and upon the state of repair and cost of operating existing truck equipment.

Tinius Olsen

Tinius Olsen, 86, inventor, engineer and retired head of a testing machinery manufacturing firm bearing his name at Philadelphia, died Oct. 20 at the home of a son, Thorsten Y. Olsen, president of the company.

Mr. Olsen came to this country from his native city of Kongsberg, Norway, sixty-five years ago and established the testing machinery plant which has become known throughout the world.

Gaining fame as an engineer, he was awarded both the John Scott Medal

and Elliott Cresson Medal by Franklin Institute, in which he took an active interest until his last illness. He was a member of the Engineers Club of Philadelphia.

Mr. Olsen was active for years in affairs of the American Society for Testing Materials, Society for Promotion of Engineering Education and American Society for Advancement of Science.

Three years ago he was honored by the title of Honorary Citizen of Kongsberg. The King of Norway also conferred upon him the title of Commander Knight of the Order of St. Olaf.

Little Radio Used For Car Advertising

Newspapers and Magazines Take Bulk of Automotive Sale Promotion Funds

NEW YORK, Oct. 26—A group of 435 national advertisers surveyed by the American Newspaper Publishers Association spent \$143,365,000 in newspapers in 1931.

Of this group, 190 also used magazine space to the extent of \$78,317,815, and 121 used radio to the amount of \$21,223,862. The split-up of appropriations for twelve groups was as follows:

	News- papers %	Mag- azines %	Radio %
Autos, trucks	64.6	33.8	1.6
Gasoline, oils	74.8	18.4	6.8
Drug sundries	78.4	17.3	4.3
Electric appliances	51.8	40.5	7.7
Finance	67.7	3.6	28.7
Foods	46.8	42.0	11.2
Radios, phonographs	58.5	26.5	15.0
Railroads	88.0	9.7	2.3
Soft drinks	65.7	21.9	12.4
Steamships	78.8	21.2	...
Tobacco	76.2	10.5	13.3
Clothing	79.9	18.1	2.0

+ + CALENDAR OF COMING EVENTS + +

FOREIGN SHOWS

Glasgow, Scottish Motor Show...Nov. 11-19
Paris, Aeronautical Show...Nov. 18-Dec. 4

CONVENTIONS

Natl. Tire Dealers Assoc., Atlanta, Ga.Nov. 14-16
Natl. Battery Mfg. Assoc. Meeting—ClevelandNov. 17-19
International Booster Clubs, DetroitDec. 4
American Society Mechanical Engineers, New York City (Annual Meeting)Dec. 5-9
M.E.M.A. Annual Convention, DetroitDec. 5-10
Natl. Exposition of Power & Mechanical Engineering, New YorkDec. 5-10
Natl. Automotive Parts Assoc.Dec. 12-14
Rubber Mfr.'s Assoc., New York City, Annual MeetingJan. 9
Annual SAE Dinner—New York Jan. 12, 1933
Highway & Building Congress, DetroitJan. 16-20
American Road Builders' Annual, DetroitJan. 16-20
Steel Founders Society, Detroit, Annual MeetingJan. 16-20
Steel Founders Soc. of America—Annual Meeting—Detroit...Jan. 16-21
Annual SAE Meeting—Detroit Jan. 23-26, 1933

American Soc. for Testing Materials (Annual Meeting)...June 26-30

SHOWS

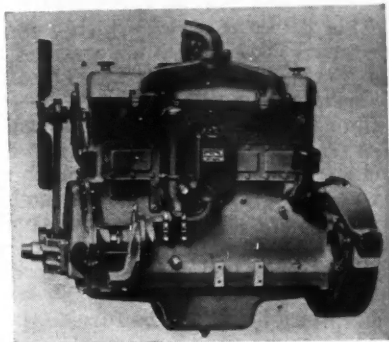
Joint M.E.M.A., M.E.W.A. and N.S.P.A. Trade Show, DetroitDec. 5-10
National Automobile Show, New YorkJan. 7-14, 1933
Pacific Automobile Show, San FranciscoJan. 7-14
St. Louis, Mo., Automobile Show, Jan. 8-14
Newark, N. J., Automobile Show Jan. 14-21
Cincinnati, Ohio, Automobile ShowJan. 15-21
Baltimore, Md., Automobile Show Jan. 21-28
Detroit, Mich., Automobile Show Jan. 21-28
Boston, Mass., Automobile Show Jan. 21-28
Washington, D. C., Automobile ShowJan. 28-Feb. 5
National Automobile Show, ChicagoJan. 28-Feb. 4, 1933
Springfield, Mass., Automobile ShowJan. 30-Feb. 4
Indianapolis, Ind., Automobile ShowFeb. 4-11
Springfield, Ill., Automobile Show Feb. 9-11
Kansas City AutomobileFeb. 11-18

NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

Michiana Oil Conditioner

Michiana Products Corp. of Michigan City, Ind., manufacturer of the H-W oil filter, has placed on the market a device known as the Michiana oil conditioner, which, like the oil filter, is secured directly to the engine block. It can be arranged to by-pass the oil around the filter, around the oil cooler, or around both when the

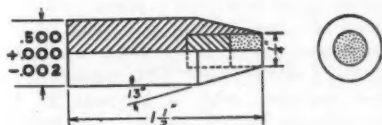


temperature is low and the oil therefore is very viscous. The oil conditioner can be readily removed from the engine for cleaning. The accompanying photo shows the first application of the oil conditioner to a Waukesha engine.

Carboloy Truing Tool

Announcement of a new type of truing tool for finish-dressing grinding wheels has been made by Carboloy Co., Inc., Detroit, Mich.

This new truing tool consists of a matrix impregnated with small, crushed diamonds, which are distributed uniformly throughout the matrix, providing an ample number of cutting



points at each new surface reached during the life of the tool. Chief among the advantages said to be found in this truing tool are (1) low initial investment cost, (2) requires no fur-

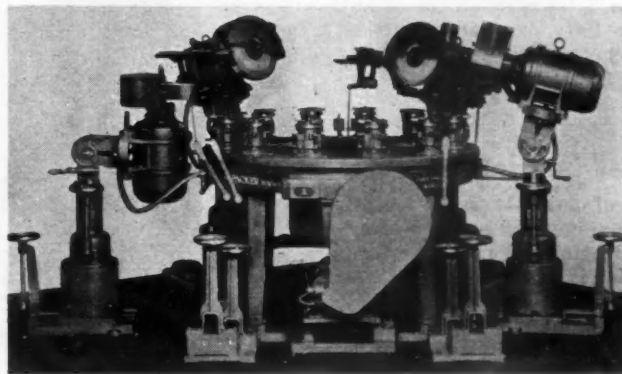
ther setting or mounting, (3) may be used economically on same grinder and same sized wheel throughout its entire life, (4) requires no special adapters, and has no moving parts to adjust, repair or replace; (5) is small, compact, and fits into any standard holder for hand or machine grinding.

The range of wheel sizes and types on which the truing tool has been successfully used covers sizes up to 36 in. diameter by 2 in. wide and "M" in hardness. On centerless grinding wheels, sizes up to 20 in. diameter by 6 in. wide can also be finished dressed economically.

Packer Buffing and Polishing Machine

The Packer Machine Co., Meriden, Conn., formerly the C. I. Packer Tool & Die Co., has added another buffing and polishing machine to its line. It can be furnished with four or five wheel heads. Each wheel is driven by a ball-bearing, totally enclosed, dust-proof motor. Three, five and seven and one-half horsepower motors can be used on these heads.

Universal wheel adjustment permits



wheel to be set to any degree from horizontal to vertical, also swivel to any required position. The wheel head pedestal can be adjusted longitudinally by means of adjusting screw operated in the floor base.

Twelve inches is the maximum diameter of work that can be polished or buffed on this machine. The work table has 12 spindles, and on each spindle is an automatic expansion chuck. To the jaws of the expansion chuck are fastened the adapters

Johns-Manville Silento Felt

Automobile body manufacturers have found a new thin deadening felt known as "Silento Felt," which is said to be practically ideal for their requirements of deadening and insulating body panels. Although this felt is only approximately 1/16 in. thick, it gives complete deadening of the vibration tendencies of metal panels.

A special cement is furnished which may be applied to the felt by machine at a high production rate. As this operation of applying the felt to the panels fits most conveniently into the body production line at a point before the bodies have entered the paint-drying ovens, the manufacturer has made both the cement and the felt of such consistency that they withstand 300 deg. F. without disintegrating or slipping off the panels.

The composition of "Silento Felt" is such that it is unaffected by moisture. In fact, it acts as a good water-proofing, protecting the otherwise exposed inner side of the metal panels from corrosion. It is manufactured by Johns-Manville, 292 Madison Ave., New York, N. Y.

or fixtures for holding the work.

The work table rotates with an intermittent action and is driven by a four-speed motor, mounted at the base of the machine. The period of dwell, that is, the length of time that the work is in contact with the wheels, may be set to suit the nature of the work and required finish.

Electrical controls consist of switches for each motor and a push button for emergency starting and stopping. All controls are centralized in front allowing full control of the

machine and complete production by a single operator.

The machine is equipped with mechanical composition feeding devices for wheels. These devices are controlled by levers at the front of the machine.

Sheet metal dust exhaust hoods over wheels are furnished with the machine. Also, the machine is completely electrically wired and at time of installation only one electrical connection is necessary.

NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools

Louis Allis Splash-Proof Motor

A Splash-Proof motor to prevent entrance of water splashed with terrific pressure from any angle, yet adequately ventilated and built in the same dimensions as standard open motors, has been perfected by The Louis Allis Co., Milwaukee.

A double baffle in an elliptical-shaped air passage in each endbell provides the protection offered by this new and original motor. This unique construction, while permitting free passage of ventilating air, traps and drains water splashed into the air openings at the bottom of the elliptical-shaped chambers. Another original feature is a shaft guard which breaks the force of a stream directed along the shaft extension and prevents water from entering the bearing chamber.

Mabelite Protective Paint

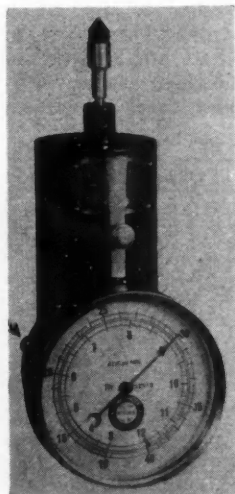
Eastern Mabelite Corp., New York, is producing a paint called Mabelite for protective coatings for industrial structures, marine equipment and machinery. The pigment of this paint, which is derived from an ore deposit in Oklahoma, is said to be chemically inert and to have excellent electrical insulating properties. It consists chiefly of ferric oxide, silica and alumina.

A New Ball-Bearing Pedestal

A new line of unit pedestals for pillow blocks is announced by the Norma-Hoffmann Bearings Corp., Stamford, Conn. This is designated as the "LUP" Series and is adapted to all average industrial requirements, in sizes to fit standard shaftings in nominal inch as well as sixteenth diameters, from 15/16-in. to 3 1/2-in. The ball bearings are the standard Norma-Hoffmann "Precision" double-row self-aligning type with adapter sleeve. The pedestals have capacity for a large volume of lubricant, with fittings for replenishing as needed. Protecting felt seals prevent escape of lubricant along the shaft. These pedestals may be had with the bearings either floating or fixed in the housing. In the latter case, suitable distance pieces are furnished for clamping the outer ring.

New Amthor Hand Tachometer

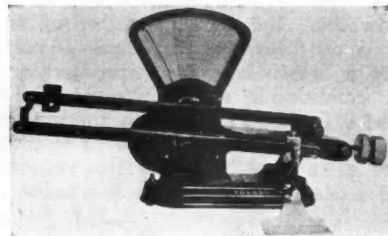
A portable tachometer, Type 350, for testing machine speeds, has just been put out by the Amthor Testing Instrument Co., 309 Johnson Street, Brooklyn, N. Y. The most important feature is the automatic fixed reading. When the tachometer is applied to a rotating shaft, the pointer instantly points to the speed on the dial, and follows every pick-up or slow-down; but when taken away, the pointer does not return to zero. It remains fixed at the last speed reading on the dial. With this feature it is no longer necessary to keep the eyes focused on the dial, and the tachometer can be used in the dark if necessary or in inaccessible places, where it is awkward to hold and read at the same time. It facilitates testing and checking speeds of engines, motors, generators, surface speeds of belts, etc.



The dial reads directly in revolutions per minute, but accessories are provided so that all "feet per minute" surface speeds can be measured. The tachometer has four speed ranges, each of which is separately read over the entire dial, thereby giving actually four times the graduation space on the one dial and consequently closer speed readings. Each is constructed with a balanced cross pendulum governor movement, is hand-calibrated for accuracy and dead beat in action.

Toledo Variation Auto-Gage

Toledo Precision Devices, Inc., Toledo, Ohio, has developed the Toledo Variation Auto-Gage, which has many applications in various fields, as it measures and indicates the increase or loss of any physical property in any material. Increases or decreases in elasticity, specific gravity or moisture are quickly shown. It will determine the percentage of volatiles which can be driven out of the material in question. It will be of help in measuring the elasticity of rubber.



This device can be furnished with any chart needed, with calibrations in per cent, elasticity, specific gravity, pounds and ounces.

Two sizes are available: For samples from two ounces to three pounds, and for samples from four ounces to six pounds. In some cases no samples are necessary as the operation is carried out by a weight submerged in the liquid to be tested. For such operations any weight desired to be suspended in a liquid can be furnished.

Toledo Dynamometer Measures Stalling Torque

Simplicity of operation making high production speeds possible features the Toledo Torque Dynamometer. This dynamometer scale, introduced by Toledo Precision Devices, Inc., Toledo, Ohio, registers the stalling torque of starting motors. Already its effectiveness under production conditions has been proved in a large automobile plant. Experience has shown that the cycle of operations takes approximately 15 seconds.

This device is easy to operate. The dynamometer is designed for mounting on a bench. A cradle for the motor to be tested is placed adjacent to it. The testing is as follows: The shaft of the motor is placed in alignment with a horizontal arm extending out from the dynamometer. After the motor is clamped into position by an eccentric, the sliding coupling on the horizontal arm is pushed over the shaft of the motor. The clamping device engages with a keyseat in the end of the motor shaft. Current is then applied to start the motor revolving. It is, however, prevented from revolving by the arm of the dynamometer. The downward pressure on the arm registers on the dial, and the operator reads the stalling torque.